

RAILROAD GAZETTE

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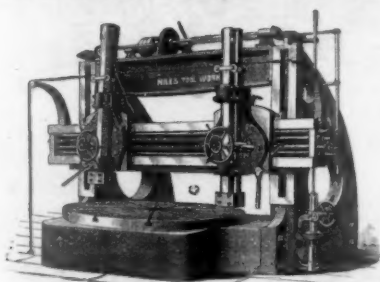
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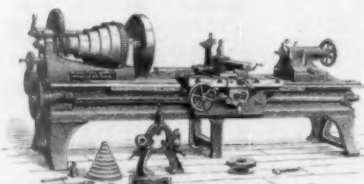
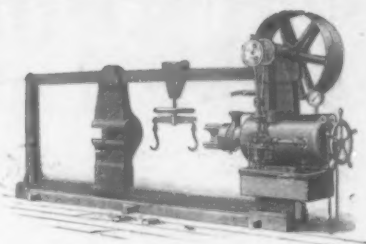
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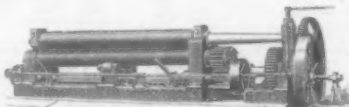


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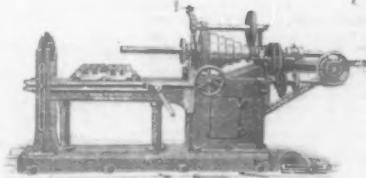
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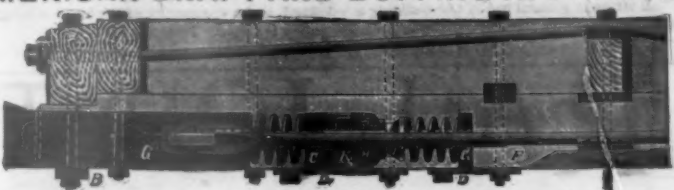
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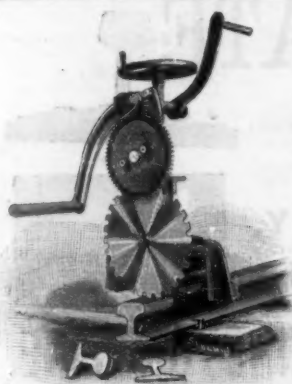
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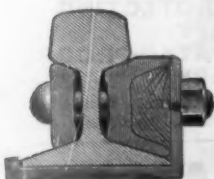
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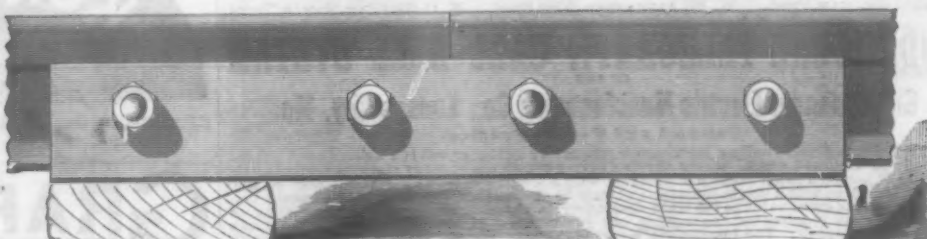
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The Wide-Range Yielding Washer is designed for the specific purpose of enabling a single operator to apply the nuts to track bolts and screw them home without the aid of an assistant. One revolution of the bolt thread fits loosely in the nut so that the nut can be started on the bolt by hand. During the operation of screwing the nut home all parts of the washer are gradually compressed into the same plane. The resistance of the washer to such compression serves to keep the oval neck of the bolt in its seat and to hold the head of the bolt against the object through which it extends. These washers are made of spring steel and are not tempered.

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This Washer is composed of a quadrangular steel bar bent into spiral form and having its ends cut diagonally and slightly overlapping each other. In use the screwing home of the nut forces the diagonally cut ends to ride upon each other. This so greatly increases the resistance of the washer to compression across both ends of the spiral are made to plough, comparatively wide grooves in the faces respectively of the nut and of the flange of other

object through which the bolt is inserted. The resiliency of the washer presses its chisel-shaped ends against the bottom of said grooves and there by opposes effective resistance to the loosening of the nut by any force short of that exerted in originally screwing the nut home. This invention, which is the outcome of Mr. Harvey's large previous experience as an inventor of successful nut locks, has the advantage that it makes a perfect nut lock without such deep abrasion or cutting of the face of the nut as to render the nut incapable of a second application.

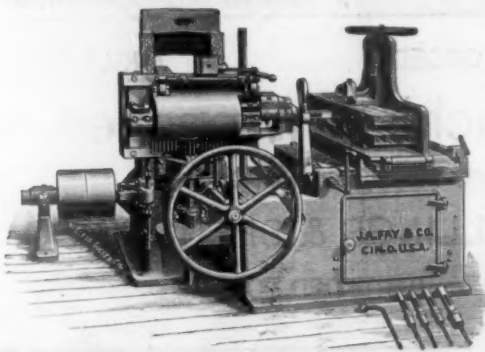
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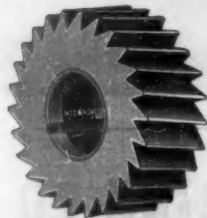
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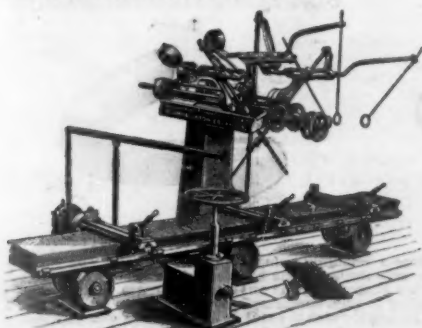
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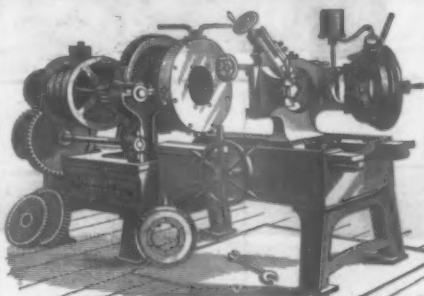
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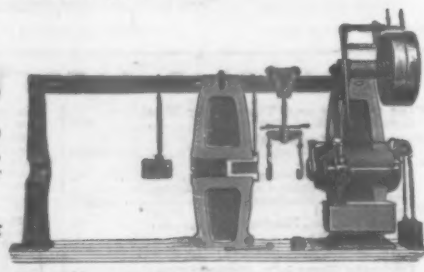
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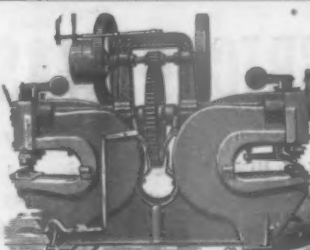
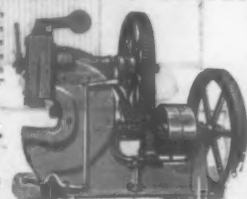
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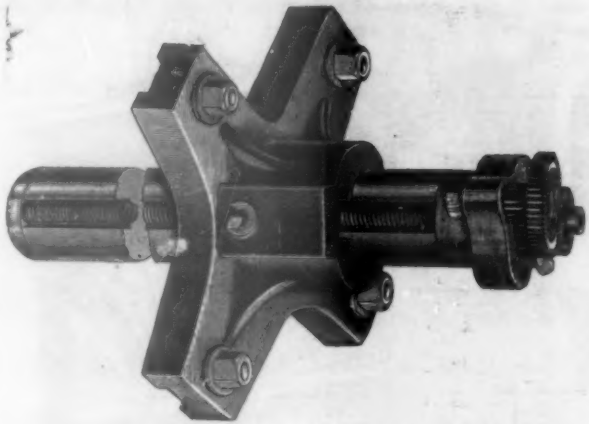
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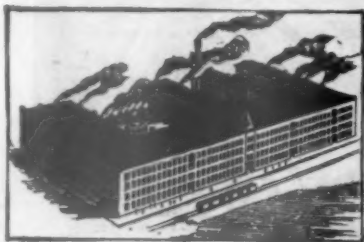


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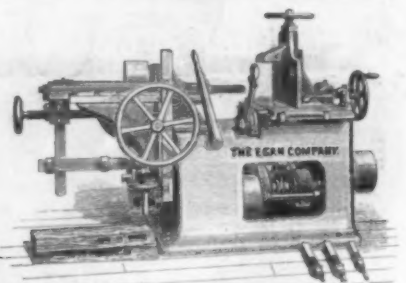
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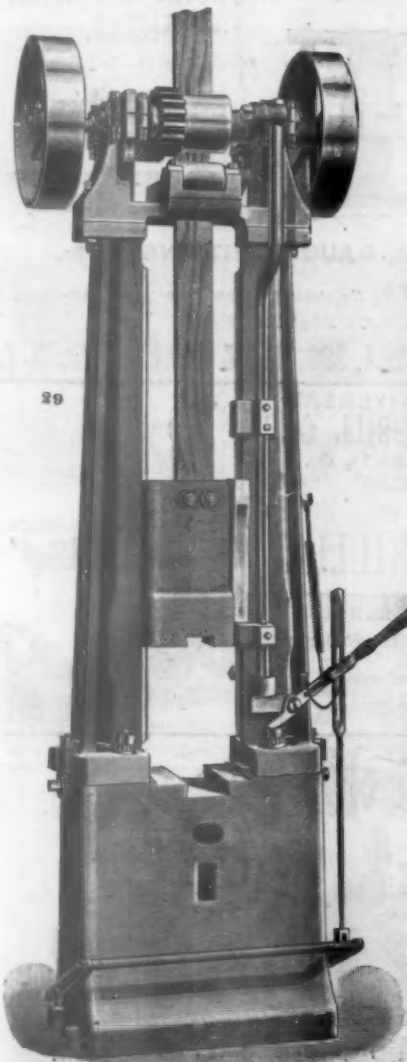
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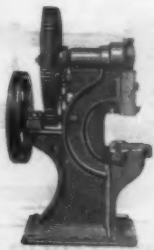
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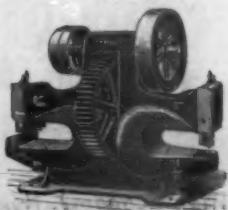
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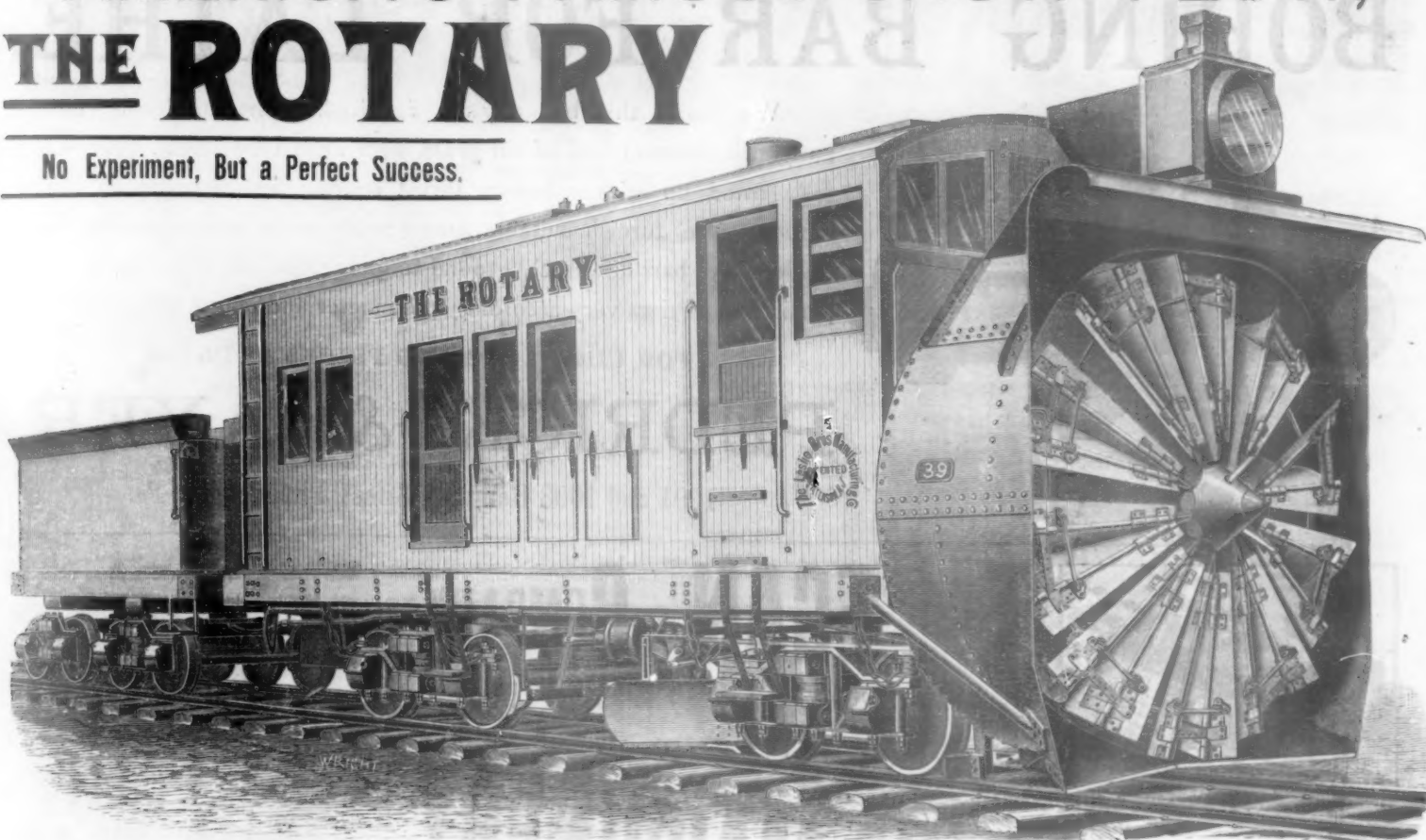
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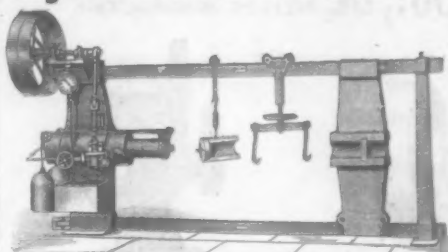
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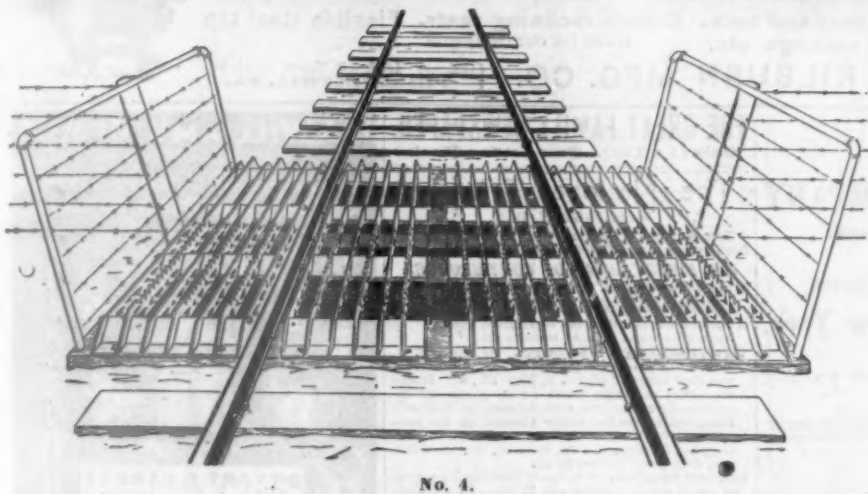
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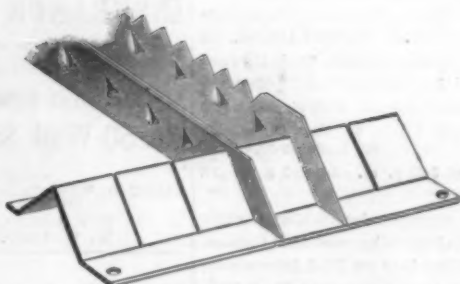
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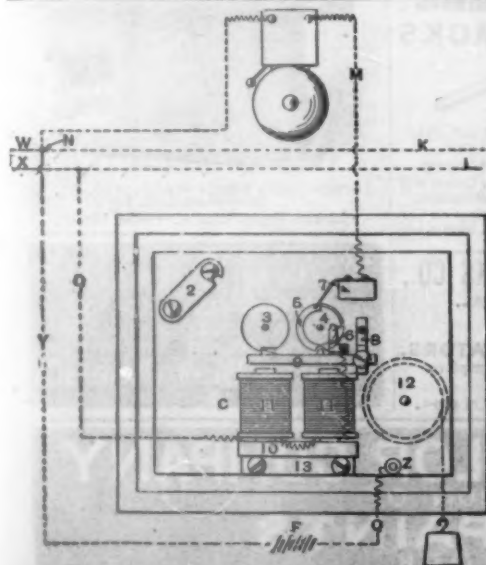
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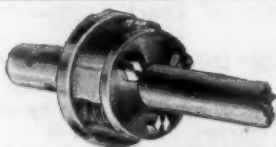
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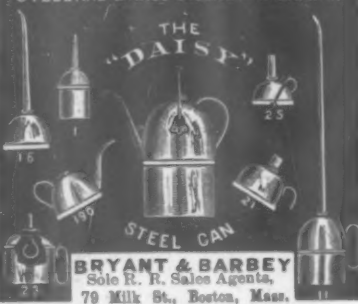
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Date.	Drawheads.	Knuckles.	Date.	Drawheads.	Knuckles.
September, 1890, -	- 5	49	May, 1891, -	- 13	100
October, " -	- 8	81	June, " -	- 28	110
November, " -	- 43	147	July, " -	- 13	72
December, " -	- 30	131	August, " -	- 19	104
January, 1891, -	- 22	116	September, " -	- 21	73
February, " -	- 66	122	October, " -	- 18	112
March, " -	- 63	172			
April, " -	- 51	176	Total, -	- 422	1,565

PERCENTAGES OF BREAKAGES FOR ONE YEAR: DRAWHEADS, 3.39 PER CENT.; KNUCKLES, 12.54 PER CENT.

These couplers were not run in solid trains of stock cars or transportation companies but were mixed promiscuously with link and pin drawbars.

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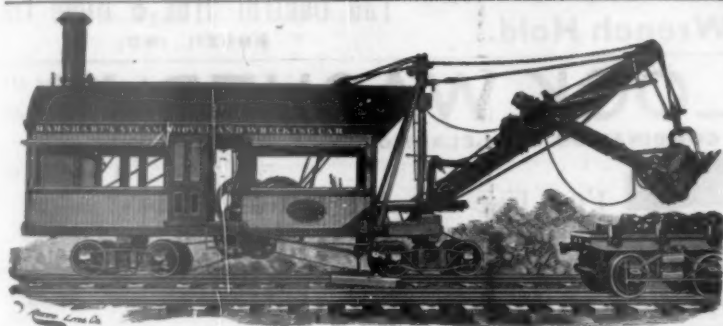
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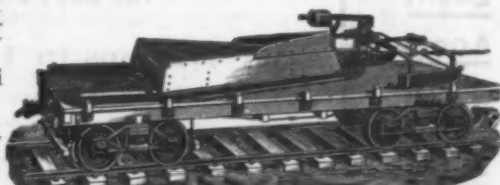
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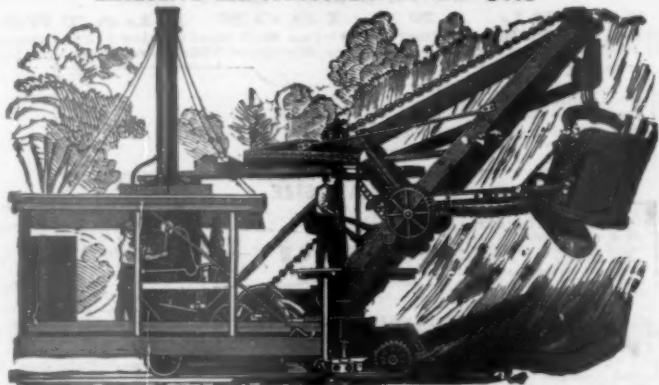
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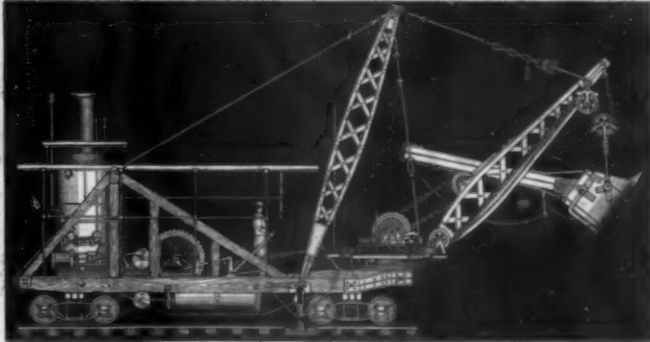
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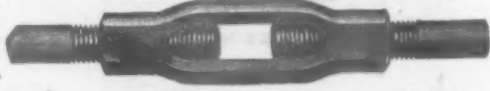
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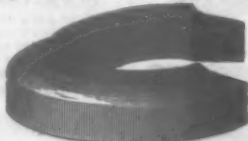
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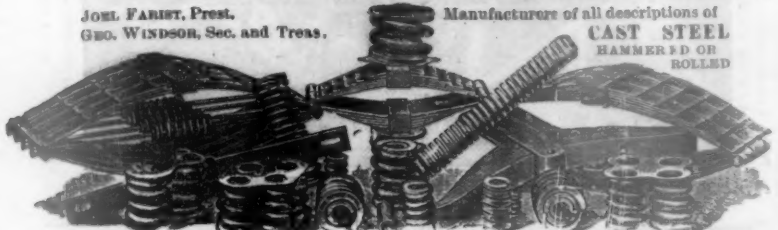
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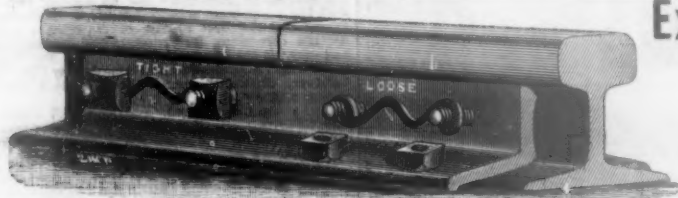
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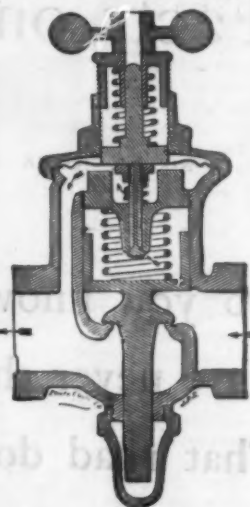
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Contributions.

Pulling Out of M. C. B. Drawheads.

Georgia Southern & Florida Railroad,
Macon, Ga., Dec. 17, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

We have recently suffered from several derailments caused by the pulling out of drawheads of automatic couplers on freight cars and the detached portion falling upon the rails. This I think a serious defect, not often met with in the old link and pin coupler, as the link will, in nearly every instance, support the broken part.

I should be glad to have any information from railroad people, or the "inventive genius," that will lead to a practical solution of this difficulty, and hope you will agree with me that it is of sufficient importance to call for a general expression of views on the subject.

J. LANE, General Manager.

[We certainly would not discourage a general expression of views on this very important subject, and would refer those who are interested to the illustration on another page of a new device by the McConway & Torley Co.—EDITOR RAILROAD GAZETTE.]

The Open Window Nuisance.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your correspondent, James Howard, has spoken to the point about the open car window. Anyone who can secure the removal of this annoyance will deserve the thanks of the traveling public generally. Sensitive women and children are forced to sit with a deadly draught playing upon delicate throat and lungs. Timid women, unattended, are forced to accost and ask a favor of a stranger in requesting that the window be lowered. A railroad company has no right to force such an alternative. Passengers who started on the journey with fairly clean collars and other clothing are forced to arrive at their destination in a filthy, begrimed condition. Children and grown persons spend hours in vain attempts to extricate from their eyes cinders and dirt that are causing excruciating pain. The really attractive scenery is unseen and unappreciated. The traveler resolves never to ride in such a dusty region again. Meantime the "practical" men have been spending money in immense sums advertising the pleasant land through which their line runs; they have at great expense ornamented the cars with beautiful work which the blinking eyes of the poor traveler cannot see and appreciate; comfortable seats are provided and their comfort forgotten by the squirming unfortunate whose whole attention is devoted to dodging cinders and to drawing breath through nostrils full of coal dust. A few cents per window spent in screens to protect each passenger from the inconsiderate mortal ahead of him, would pay better than a hundred times as much expended in tinsel and ornamentation of the car, and draw more suburban residents than all the clap trap advertising the road can spend money upon.

VICTIM.

Affairs in China.

TIENTSIN, Nov. 12, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The impression ought not to go abroad that China is really anxious for railroads. This may be the case some day when ten per cent. of those in power have seen railroads, instead of the one in a million, or less, who now know anything about them. The idea of Li and other Chinese statesmen is to prevent foreigners having any chance of eating up the country by war or trade, or a mixture of both. They are doubtful of the value of Western civilization, and have good reason to be so, considering

the troubles which you have, which are immensely magnified by the time they reach Chinese ears.

Do not believe that a foreign loan is being made on a big scale for railroads. The Chinese intend to build solely with their own money and, so far as possible, with native engineers. Krupp sent out an engineer to persuade His Excellency, Li, to give him a line to build for nothing. Li sent this engineer to Mr. Kinder, who refused to use a man over whom he had no control and who was being paid by Krupp. So he has been set to teaching 20 military students in engineering, who will be eventually added to Mr. Kinder's staff.

It will be two years at least before rails can be made in China. The works at Hankow are not far advanced. Iron ore is obtainable, but no suitable fuel has been found near Hankow. If fuel is sent from North China the cost will be such that rails cannot be delivered in the North as low as \$33 gold per ton. These works are being built by Englishmen and Belgians. The railroad to the iron ore, 16 miles long, is in German hands, and altogether there is considerable confusion in the management. No doubt the English rail makers can easily hold the market until other works are started, solely in foreign hands. Tenders for 2,000 tons 60-lb. steel rails were received this month from Blockow & Vaughan at \$33 gold, and from Krupp at \$37, and several other higher bids were received. The price includes angle plates and fastenings. Woodenties are offered for from 87 cents from the United States and Canada down to 68 cents from Japan and Russia. The contract was divided.

The American Vice-Consul, Mr. Pettrick, who has been 20 years in His Excellency's service as interpreter, has been made Assistant Managing Director of the Railroad Department. He is a good man as an interpreter, but his want of business knowledge and experience and his extreme Chinese conservatism are very much against his usefulness. The silver mines, which were more or less under his control, have been closed and the whole staff sent back to America. This is a great blow to mining here, and is the more to be regretted as Mr. Darlington, the chief, was just getting things into first-class order and success was close at hand.

For some absurd reason the line from Kuyeh to Shan Hai Kwai is to be kept distinct from the old line. Mr. Kinder is Engineer in Chief of the Imperial Railways and has given up for the present any connection with the China Railway Co. The amalgamation must, however, take place soon.

By the way, the Emperor has given to Mr. Kinder the decoration of the Double Dragon order of the highest class which any one below the rank of a prince or an ambassador can receive, which is a great concession to western ideas that a civil engineer is not a mere skilled carpenter.

The Russians are pushing on their line with Chinese labor. Most of the convict workmen escaped. They are using a 54-lb. rail on 8 ft. ties, 5 ft. gauge.

The Chinese line will be built as far as Kirin as fast as money can be raised. When this is done Russia can not take Manchuria, if the Chinese stick to their guns, which they will do if they have white officers.

Detention and Diversion of Cars.

AMERICUS, Ga., Dec. 22, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In sending you my letter of the 2d it was not my intention to begin an unending controversy. I simply desired to present in as condensed form as possible the results of considerable thought and practical experience. I knew I would be opposed from every quarter, for my suggestions, though simple, would be treated as radical. My desire was to enlist the attention of the railway world, in the hope that some suggestion might act as a spark and fire a train of thought in the right direction.

I read the criticisms of Messrs. Voorhees and Yardley with sincere pleasure, but would have also liked to have heard from some one equally as prominent, but not so thoroughly committed to per diem as these two gentlemen.

I did not intend, by my article, to convey the impression that I opposed per diem. To the contrary, I believe sincerely that per diem to some extent will sooner or later be adopted as a standard, but the present plan is entirely too cumbersome. This remark alone is sufficient to draw down on my poor head all the vials of wrath possessed by the per diem faction. For at least six years they have preached the present plan of per diem. Committee after committee have been appointed, statements prepared and appeals sent in every direction imploring its universal adoption, yet to-day we find it looked upon with suspicion by many and utterly repudiated by some. Does this indicate that straight per diem is the panacea for all our troubles and the Mecca of our hopes?

Before adopting a universal plan, it is imperative that one be produced that can be utilized by short lines as well as by large systems. In most articles on the subject, the fact is overlooked that a majority of the roads operated in the United States are short lines. My experience, after service on both trunk and short lines, has taught me that both mileage and per diem, as proposed by Messrs. Voorhees and Yardley, cannot be operated on a majority of roads on account of the additional expenditure required, and that per diem pure and simple is impossible unless we deem it advisable to discontinue our present and indispensable custom

of using mileage as the basis of our statements of earnings and expenditures. Mr. Yardley states that if it is true straight per diem will not do away with the calculation of mileage, but would simplify it, as the calculations now made for purpose of settlement would not be necessary, and that there would be a great saving in clerk hire, owing to the fact that mileage to base the cost of operation does not require the division of cars according to ownership. This may appear to him as a great saving, but I must confess that the amount of labor saved in this way is to my mind very small, and would be swallowed by the additional cost of virtually two records. We must obtain the total loaded and empty mileage of all classes of cars any way, and the labor of dividing according to ownership is but little in addition, while the calculations are as nothing.

The plan suggested by me is not intended to necessarily force large systems to make their settlements for delays through their junctional agents. Any road could exercise its own sweet will in the matter, and if desirable keep the records and make the settlements through their car record office, or through any other department desired. All roads even now do not settle their mileage accounts alike. All the "red tape" desired can be added, and at the same time not force weaker lines to do the same.

Mr. Yardley also has apparently forgotten the fact that many roads, both large and small, now require receipts for their cars, and that it would not be necessary to take separate receipts for each car, one receipt after yard clerks have checked against one another being sufficient for each day's business. Surely his yard clerks now check against the yard clerks of other systems. He likewise lays particular stress upon keeping "destination." I know not what is the custom of the great lines he represents, but I have before me the forms of the Louisville & Nashville, Richmond & Danville, Georgia and East Tennessee, Virginia & Georgia roads, and they each show destination on junction records now. Two of them also keep a record of point of shipment, consignee and contents, while one goes so far as to keep on the same form a record of switching charges. If so much can be done now, surely it might be possible to show destination should my feeble suggestions be ever adopted.

I do not consider it necessary to burden our auditing department by requiring them to check these statements. Our car record offices now check all statements received from junctional points and one check would do for all.

I am firmly convinced that were something like my ideas adopted, all short lines could come under a universal system without one cent of additional cost. I also believe larger systems could do the same, and even if they could not, the increased expenditure would be by far less than that of any method of per diem yet suggested. Being a transportation man, daily struggling to provide cars and move loads promptly, not being confined to the routine work of a car record office, I recognize thoroughly that something must be done, and that quickly, to insure a prompt return of cars.

E. T. B. GLENN.

Some Canal Projects.

Concurrently with the project for deepening the waterways of the lakes various plans for tributary canals are put forward. The canal, on the American side, around the Niagara Falls is the only one to which the attention of Congress has been called so far. On the 16th inst. Senator Davis, of Minnesota, introduced a bill calling for an appropriation of \$1,000,000 for surveys and the commencement of work on this canal. It would probably be better and accomplish more if the Senator's bill had provided for a thorough and comprehensive survey which might determine the best location, to be followed by an estimate of cost. There is on the part of many Western men a desire, if not a determination, to have grain carried past Buffalo without a break of bulk, but that desire should not lead to the location of a route either by congressional enactment or by a general convention. Such work is best done by competent engineers.

Neglecting the Lake Erie and Pittsburgh Canal, which was located and ably advocated by the late John M. Goodwin, the next project, going west, is that of a State Senator from Wyandot, O. He proposes that the State shall sell all of its canals and canal property, except the Miami & Erie, between Toledo and Cincinnati, and the Ohio Canal which extends from Cleveland to the Government Improvement of the Muskingum River. The proceeds of such sale to be applied to converting the two reserved canals into such waterways that the large Mississippi and Ohio River steamboats can load and unload at the Lake Erie docks. The estimated cost of this improvement is, according to State Senator Gear, \$18,000,000 for the Miami, and \$10,000,000 for the Cleveland and Muskingum route, or an aggregate of \$28,000,000. The estimated cost of the Lake Erie and Pittsburgh Canal, with a depth suitable for the smaller class of lake vessels, was \$22,000,000.

The Chamber of Commerce of St. Paul is advocating and pushing a scheme for "a canal wide and deep enough to carry the largest whaleback boats on the lake" between the Mississippi at the mouth of the Croix up one branch of that river, through Northwestern Wisconsin and down the Black River to Lake Super-

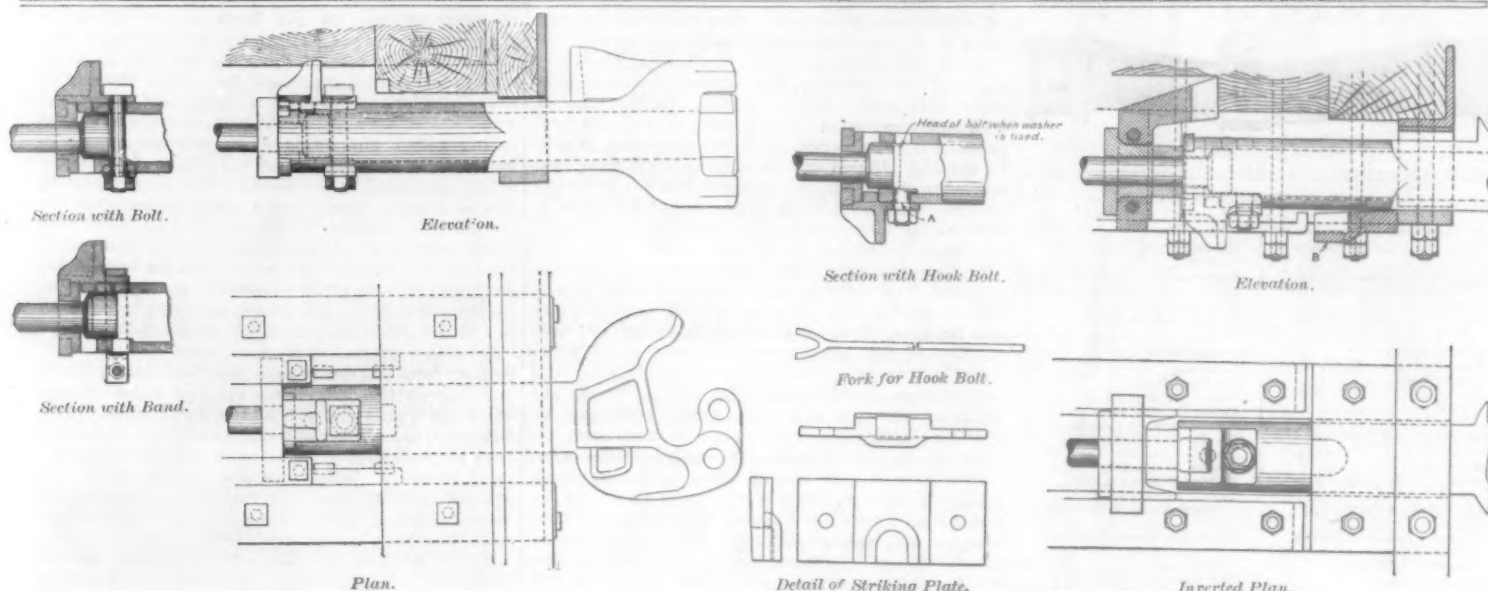


Fig. 1.—Application with the M. C. B. Draught Rigging.

Fig. 2.—Application with Graham Draught Rigging.

A SAFETY STOP FOR THE JANNEY COUPLER.

rior. This would enable freight from St. Paul to reach Buffalo, after some necessary improvement in the depth of the Upper Mississippi, or boats from the upper lakes to go to St. Louis or New Orleans. No estimate of the cost of this canal is mentioned, but a bill is to be introduced into this Congress asking for a large appropriation in aid of the improvement.

A Safety Stop for the Janney Coupler.

The communication from Mr. Lane, which appears on another page, calls attention to a defect in the M. C. B. coupler which has long been recognized by makers of that coupler as one to be overcome. The fundamental remedy against the pulling out of drawbars when they become detached from the car is to dispense with the use of a spindle, or tail bolt, entirely and use a yoke instead. We have heard of no trouble of this kind where the yoke is used, but such a radical change must be gradual, although probably it will be effected in the course of time. Meantime the difficulty arising from the pulling out of the tail bolt will have to be met. Ordinarily the tail bolt is released, allowing the drawhead to pull out, by the dropping out of the key, but it has happened where the head of the bolt has been made too small that it has worn and broken its way through the back end of the drawhead. The safety stop which is illustrated has been designed to meet this difficulty, and has been carefully studied for some time, and subjected to a great deal of criticism. It is now put out with confidence that it will meet the requirements.

Fig. 1 shows the stop arranged for use with the M. C. B. draught rigging. This stop is of malleable cast iron. It is made with a lug to engage in a hole in the tail of the shank of the drawhead, which hole exists in the drawheads now in use. The stop is held fast in position by a bolt as shown. The arrangement is simple and is very clearly shown in section, elevation and plan. A modification is shown, to be used in cases where the head of the tail bolt is so long that the bolt holding the stop cannot be inserted. In this case a special stop is made, with two lugs, one to engage in the bolt hole through the drawbar, and the stop is kept in place by a wrought iron band with one bolt below.

In case of failure of the tail bolt the drawhead goes forward until the stop engages with the end sill, and there it is held. In the illustration a notch is shown cut in the lower corner of the end sill to allow the head of the bolt which holds the stop to pass forward.

In fig. 2 is shown the arrangement of this stop for use with the Graham draught gear. Here the stop is put below the drawbar and a cast iron striking plate, shown in detail in three views in the lower left hand corner of the cut, is provided. This striking plate, indicated by the letter B, receives and transmits the blow of the stop, and it is held securely in place by two bolts as shown. The striking plate is notched to allow the nut holding the stop to pass.

A hook bolt A is shown in this cut. This bolt is inserted in the drawbar, and may be pushed back, by using the fork shown in the sketch, without disconnecting or removing any part of the coupler. The bolt is conical and the tee head prevents its turning when the nut is screwed up. It will be seen that the head of the tail bolt passes over this latter bolt. In case the head of the tail bolt is too long to allow the hook bolt to be entered the key can be taken out and the tail bolt slipped out of the way.

This device is applicable to all the Janney couplers now out, and the McConway & Torley Co. will furnish it free for their couplers now in use and for new orders, so that the expense of applying it is very slight.

It will be observed that this stop is not applicable to the Butler draught rigging, but in that case the evil is avoided by the use of the yoke.

Other contrivances have been made to do away with the danger of pulling out drawheads. One of them is the unlocking device of Mr. Garstang, by which, when the drawhead pulls out beyond a certain distance, the knuckle is allowed to open and free it. But it goes without saying that it is almost as desirable to keep a train from parting as it is to keep a drawhead from pulling out. Another device is that of Captain Wade, of the Richmond & Danville, by which a drawhead that pulls out is caught and kept from dropping on the track.

Recent Locomotives of the Cleveland, Cincinnati, Chicago & St. Louis.

We give in this issue illustrations of three locomotives of new design for the Cleveland, Cincinnati, Chicago &

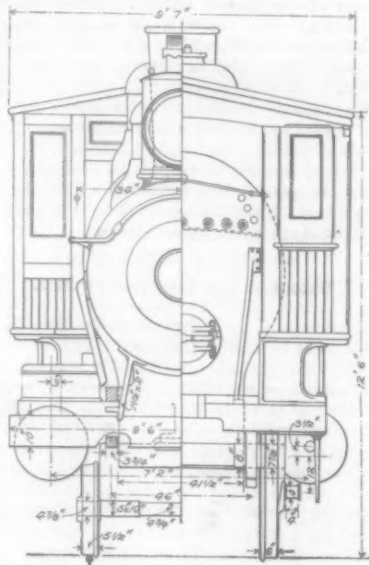


Fig. 2.

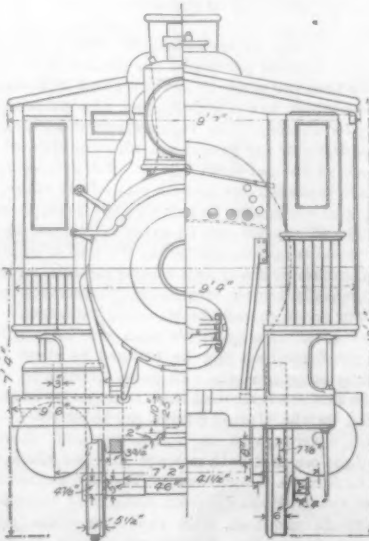


Fig. 4.

St. Louis Railway. Figs. 1 and 2 show the 10-wheel passenger engine; figs. 3 and 4 the 10-wheel freight engine and fig. 5 the six-wheel switching engine. The following table gives the general dimensions of the engines:

	Class O. Passenger.	Class A. Freight.	Class F. Switching.
Type of engine	10 Wheel.	10 Wheel.	6 Wheel.
Cylinders	18 1/2 in. x 24 in.	19 in. x 24 in.	18 in. x 24 in.
Diam. of driving wheel	66 in.	56 in.	50 in.
Diam. of engine truck wheel	30 in.	28 in.	26 in.
Diam. of boiler	60 in.	60 in.	56 in.
Form of boiler	Wagon top.	Wagon top.	Straight.
Size of firebox inside sheets	77 1/2 x 33 1/2 in.	77 1/2 x 33 1/2 in.	83 1/2 x 31 1/2 in.
Number of tubes	272	272	208
Size of tubes	2 in.	2 in.	2 in.
Length of tubes	13 ft. 1 1/4 in.	13 ft. 4 1/4 in.	11 ft. 1 1/4 in.
Heating surface of tubes	1,883.45 sq. ft.	1,883.45 sq. ft.	1,195.34 sq. ft.
Heating surface of firebox	147.03 sq. ft.	147.03 sq. ft.	120.7 sq. ft.
Total heating surface	2,030.48 sq. ft.	2,030.48 sq. ft.	1,316.04 sq. ft.
Grate area	18.16 sq. ft.	18.16 sq. ft.	18.44 sq. ft.
Driving wheel base	15 ft. 6 in.	15 ft. 6 in.	11 ft.
Total wheel base	25 ft. 8 in.	25 ft. 8 in.	11 ft.
Weight on drivers, engine loaded, with 3 guages water	102,800 lbs.	99,000 lbs.	100,400 lbs.
Weight on trucks, engine loaded, with 3 guages water	28,600 lbs.	28,600 lbs.	28,600 lbs.
Total weight, loaded, with 3 guages of water	131,400 lbs.	128,200 lbs.	100,400 lbs.
Water capacity of tank	3,700 galls.	3,700 galls.	2,700 galls.
Coal capacity	7 tons.	7 tons.	4 tons.
Total weight of tender loaded with coal and water	76,800 lbs.	76,800 lbs.	61,600 lbs.
Boiler pressure	160 lbs.	160 lbs.	160 lbs.
Diam. of truck wheel	33 in.	33 in.	33 in.
Name of builder	Brooks Loco. Works.	Brooks Loco. Works.	Brooks Loco. Works.

Engines of similar type were built in 1890, but some changes have been made since that time. These engines all have Fox solid pressed steel boiler fronts, and 3 1/2 mesh smoke box netting. The driving boxes and rod brasses are of Damascus bronze. The fire brick arches are supported upon angle irons attached to the sides of the firebox. The Sullivan metallic packing is used on these engines.

The 10-wheel freight engines have taken 35 loads with ease from Galion to Union City up grades of 38 ft. to the mile and around reversed curves at a good freight train speed. The average cost per mile run for the engine is 17.6 cents; average number of loaded cars hauled one mile, 26.4; average loaded cars hauled to ton of coal used, 540.4; miles run per ton of coal, 20.47.

The 10-wheelers are particularly handsome engines, and have been doing good work since they were put into service. All parts are made of unusual strength. The frame construction in front of the cylinders is admirable. It will be noticed that the design of all parts is simple and easy of access.

Public Opinion Regarding the New York Central.

In discussing the Hastings collision, we have said that our previous utterances were too well known and too recent to need reiteration; but for the benefit of new readers we will quote one or two extracts from former articles. The *Railroad Gazette* has preached the virtues of the block system for many years, and declared the whole gospel in 1882, when the Spuyten Duyvil collision occurred on this same road, and long before; but we will now go back no farther than 1889. On Oct. 4 of

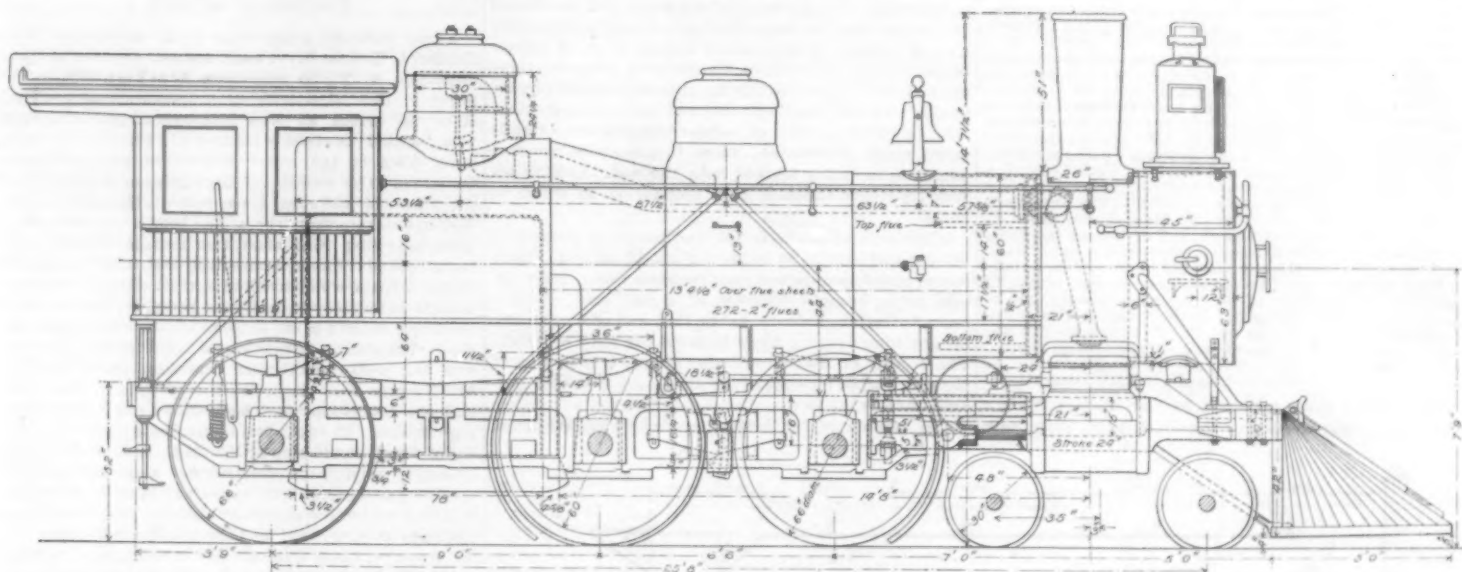


Fig. 1—10-Wheel Express Locomotive.

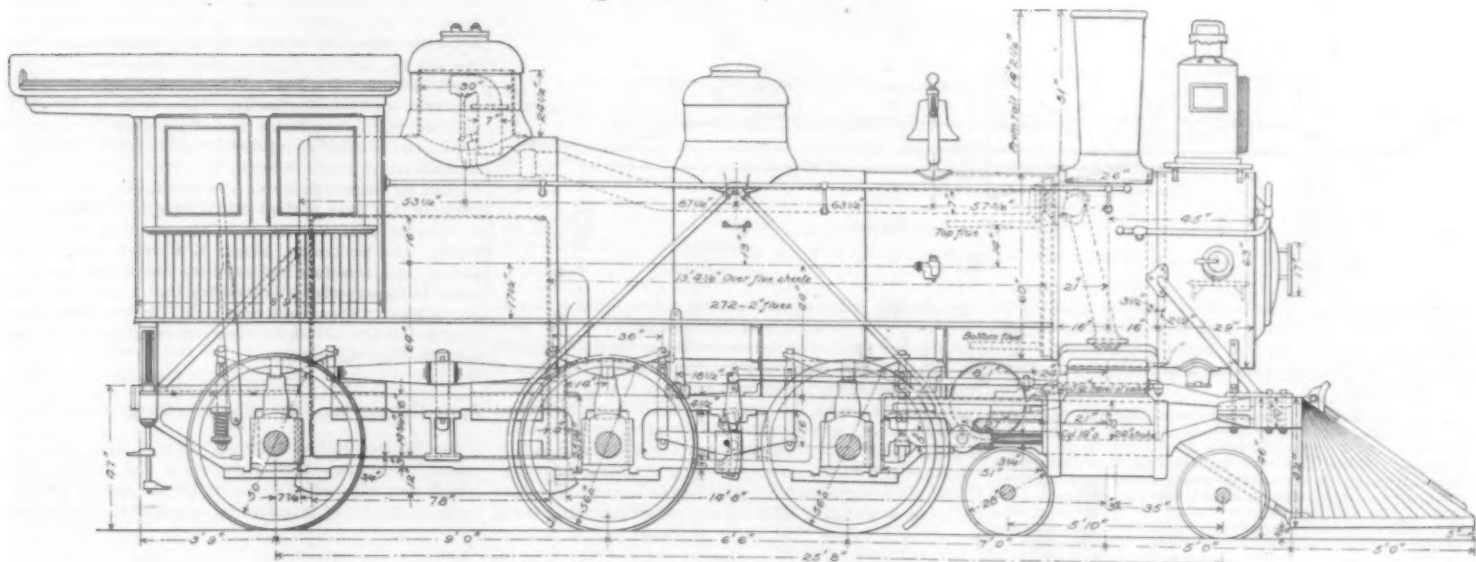


Fig. 3—10-Wheel Freight Locomotive.

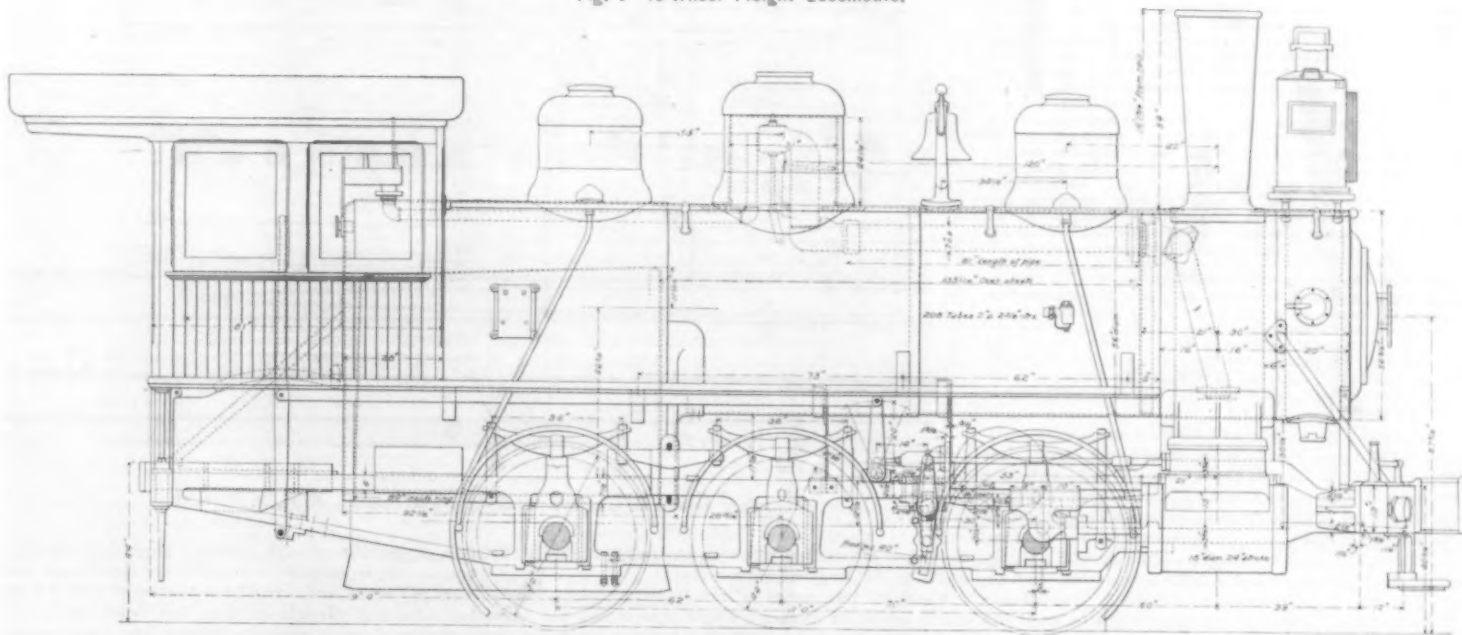


Fig. 5—Six-Wheel Switching Locomotive.

RECENT LOCOMOTIVES OF THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY.

BROOKS LOCOMOTIVE WORKS, Builders.

MR. F. P. BOATMAN, Superintendent of Motive Power.

that year, speaking of Palatine Bridge, we said, among other things:
 . . . The considerations which go to show that a block system is better than the time interval and flagging system are so conclusive that it is really a matter of but secondary importance that exact statistics are not available to absolutely prove this superiority from actual experience. That a fixed point, at which an engineer must look for a danger signal, is safer than requiring him to look for it constantly; that a man who makes it his business to constantly protect trains is less likely to err in judgment than is a brakeman who has other duties and whose chief aim often is to reach the end of the trip as

soon as his engineer does, is as evident as is the fact that a space interval is incomparably safer than a time interval. The inevitable percentage of mistakes, so much talked of, results largely from lack of discipline; and the maintenance of proper discipline is, in a block system, boys' play as compared with the difficulties of making brakemen go back to flag. A superintendent of one of the best disciplined roads in the country said that his rear brakemen obeyed the flagging rule when he (the superintendent) was on the train! We have assumed that mathematical proof of the superiority of block signaling is unavailable, and in view of the many differences of conditions

in American and European practice it is perhaps well to rest on that assumption; but it is a significant fact that of the 1,200 accidents investigated by the British Board of Trade in the last 13 years only 55 (about four per cent.) were rear collisions. . . . Everyone knows, however, that the financial question is often, if not generally, the ruling consideration in railroad matters, and, without stopping to argue fine points, the public will ask why the New York Central directors have not adopted a safer system. That they have the block system on a portion of their road shows that they appreciate its value. The equipment of 500 miles of road, with the proper buildings and fixtures, and the maintenance of the system afterward, is an impor-

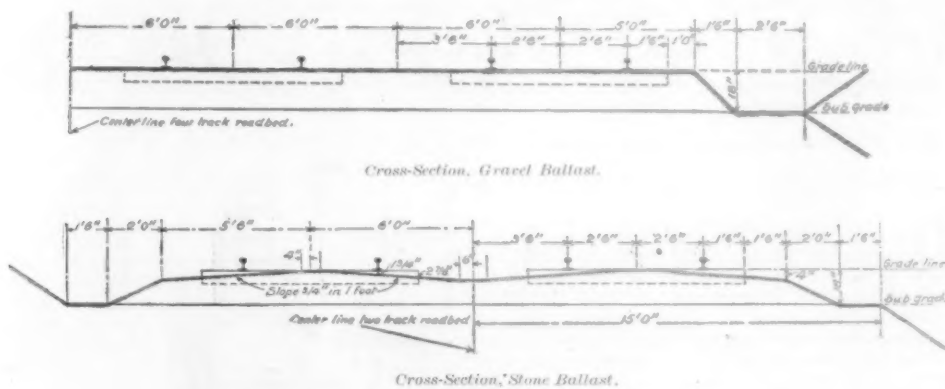
tant item, but knowing the Central's immense traffic, people will at once make comparison with the Pennsylvania, which maintains a system at large expense on a mileage greater than the Central's main line. There is also a suggestive question for all directors in the differences of practice observable in different parts of the same system of roads. Instances of the most divergent practice on roads owned or controlled by the same interests are common, and noteworthy as the almost inexplicable, but the spectacle of the West Shore, a Vanderbilt road, using the block system, and the New York Central, a much larger Vanderbilt road, doing without it, is a glaring instance of this state of things. The New York Central acquired control of the West Shore after its block system was established, and of course the usual arguments in favor of a conservative policy apply here; but when it is considered that the block system entails a large annual expenditure, the query at once comes up whether the practice of the two roads should not be made more nearly uniform. If the great expense is unwarrantable, why should not the directors abolish the system on the poor West Shore? If the system is a necessity in safe train working, why should it not be adopted on the more prosperous New York Central?

The matter came up again on Nov. 29 (page 789) in a discussion of the decision of the New York State rail-

throughout. The plane of the sub-grade and the line of bank slope bear the same relation to the rails with either kind of ballast. This matter of having 18 in. of ballast below the top of the tire is, theoretically, about the right amount; but in practice this figure is not very frequently found. Where a roadbed is old and has received attention the better quality of ballast occasionally extends down quite a distance, when it gradually becomes poorer from being worked into the soil. This mixed stage, however, forms a good foundation on which to build.

Other cuts show in detail the manner of protecting bridges and trestles by inside and outside guards. Both sets of guards are curved from the same point, those inside being brought together at a cast shoe which is securely fastened down to the ties, and acts as a rider for anything hanging down from the car body or truck. The spread of the outer timber guards is 10 ft. 4 in. at the end, or 8 ft. forward of the shoe, thus requiring several extra-length ties.

The spacing of the bridge ties is here different from



Standard Cross-Section of Roadbed—N. Y., N. H. & H.

road commissioners. As the weak position taken by the commissioners then may have had its influence on the action (inaction) of the New York Central directors this phase of the question is not without interest at this time. We then said:

The Board of Railroad Commissioners "has been investigating the matter of block systems, but has not yet sufficient data to express a positive opinion on the subject." It is difficult to understand this paragraph. The only practical arguments against the block system, certainly the only ones on a road like the Mohawk Division of the Central, where trains of different speed have different tracks, are delay to trains and expense. With a ten-minute interval, *the Commissioners recommend*, passenger trains at 6 and 8 mile aparts at 35 and 50 m. an hour, respectively. The Central could, therefore, establish blocks at four or five mile intervals, and thus increase the safety of its trains without hindering them in the least, and, in fact, could reduce the interval for the faster trains. Certainly every one agrees that a space interval is better than a time interval; and we think the substantially unanimous opinion of the most intelligent railroad officers is that this is true when the interval is maintained by a good block system, like the Pennsylvania's or the West Shore's, even in the absence of electric interlocking. So much for the question of delays. As to expense, let the Central look at the West Shore. For the first 20 stations west from Albany the Central would have to establish only two new stations to make blocks averaging less than four miles in length, the maximum being about six and a half miles. This is a crude calculation, which the officers of the road could doubtless improve upon. It does not appear that a station employee need spend any more time blocking trains than is now given to the indicators, and station operators attend to block signals in very many cases on other roads. The position of the Commissioners is therefore inexplicable. With the experience of the past 10 years in this country and of the past 25 in Great Britain, are they still without the basis for an intelligent opinion? Perhaps the financial question troubles them; but why should that modify a technical standard?

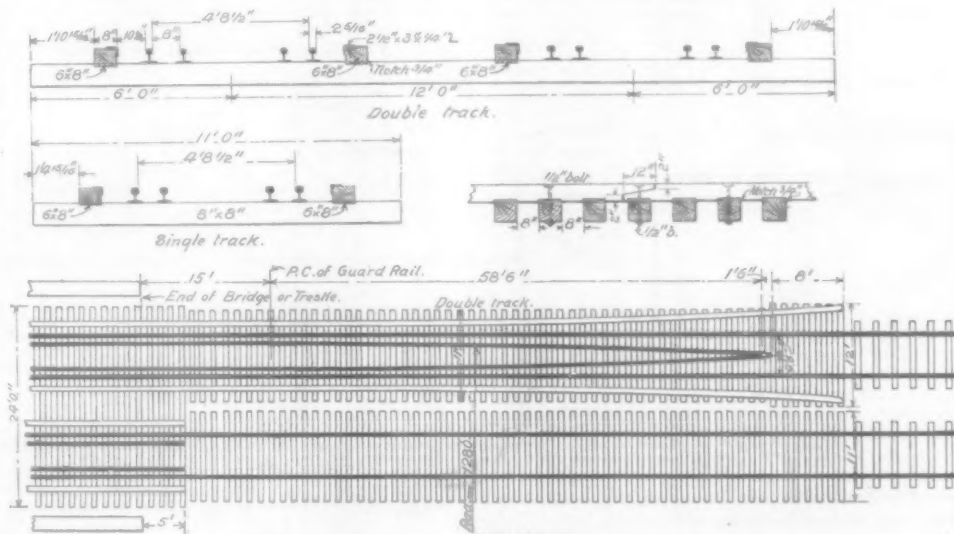
Our prediction that the public would ask certain pertinent questions has in one sense failed to come true. That is, the public did not ask the questions with sufficient emphasis to amount to much. The inadequate action of the New York public's special representatives, the Railroad Commissioners, has just been referred to. But the daily press has taken up the Hastings case with a highly satisfactory energy, wisdom and moderation, and decided results already appear to be in sight. The officers of the road tell the reporters that they will at once put in use the best available system.

Certain Standards of the N. Y., N. H. & H.

In our issue of Aug. 14, 1891, appeared a pretty comprehensive account of the work in progress on the New York, New Haven & Hartford. Herewith will be found illustrations of certain track and bridge standards.

The cuts show the manner of ballasting with either gravel or stone. The slope of the former is such as to give good drainage, the space between the tracks being graded down uniformly and the water allowed to run out at the side through boxes at stated intervals. With stone the coarseness of the material gives ample drainage of itself without any slope, so that the dressing is straight across at the tops of the ties. This latter is shown for four tracks with a spacing of 12 ft. centres.

the practice followed on some lines, 4 in. being occasionally met with through well timbered sections. The well-established form of angle iron corner for the timber guard is adhered to. The very gradual drawing together of the guards as here shown will guide a truck to a position parallel with the rails, where the short flaring guards so often used allow the truck to strike them at such a large angle as to cause mounting of the guard by the forward wheel, thereby proving of little or no protection. This angle should in all cases be kept so small as to give a glancing blow to any object traveling along



Standard Floor and Approach or Bridges and Trestles—N. Y., N. H. & H.

the track, rather than allowing any resistance from the guard to this longitudinal movement.

Although this company has abolished nearly thirty grade crossings during a single year, it has not been able to get at any standard size of bridge truss for use over such roadways, owing to the many different conditions arising at the various points, and from the unwillingness of the selectmen in the townships, and the landowners along the line, to allow any changes in the direction or measurements of the highways, or their point of crossing. If it were possible to always have the crossing at right angles, and of one or two standard widths, by the purchase of land, in the case of roads crossing at an acute angle, and running the road along the track, and then directly under (or over), the saving would amount to quite an item in time and money. By this reduction in the length of the bridge, and bringing down to a standard, the shops could keep ahead sufficiently to avoid delay, and should the immediate erecting of a structure at any place be made imperative from any cause, the supply might be drawn upon to advantage.

The Hastings Collision.

A rear collision of passenger trains on the New York Central & Hudson River road, a short distance north of Hastings, N. Y., 20 miles from New York City, on the night of Dec. 24, was the most disastrous on that road since the wreck at New Hamburg in 1879, 12 persons being killed or fatally injured and eight others badly hurt. Two of the killed and two of the injured were trainmen. The details of the collision, as reported by the officers of the road, are as follows, though the press despatches state that there had been a less serious collision near Sing Sing about two hours previously, causing a blockade of many trains, and that this blockade led to the stoppage which resulted in this collision. Train No. 43 northbound, stopped at Dobbs Ferry, 1½ miles north of Hastings, about 8 p. m., to make slight repairs on the engine. The station distant signal was thrown to danger and the next northbound passenger train, No. 45, the Niagara Falls Express, was stopped by this signal and the brakeman went back with a red light to Hastings station. The next train due was a local passenger train, which would stop at Hastings, and the brakeman, evidently relying on this regular stop, went into the station and entered into conversation with the agent. But the local train was omitted that day on account of the blockade at Sing Sing, and the next train to come was No. 7, the St. Louis Express, and this came on and rushed past Hastings at full speed, while the brakeman was inside the building. He exclaimed, "That's one on me," and hurried out, but was too late to stop the train. Train 45 was standing on a curve and the St. Louis Express ran into it at probably 30 or 40 miles an hour; and the engine, a 60-ton eight-wheeler, crashed through the whole length of a heavy Wagner sleeping car, which was split open longitudinally. There were in this car 20 passengers, the conductor and the porter, of whom 20 persons were killed or injured, as above noted. Some one or more attachments of the boiler of the locomotive were broken off and considerable steam escaped; the reports indicate that most of the victims were badly scalded. It is asserted that the escape of steam was at the safety valve. The brakeman, Albert E. Herrick disappeared, and at last accounts had not been found, but he sent a letter to the superintendent saying that he put torpedoes on the track "about half way back" [to Hastings?], and that he left his red light near the track when he went into the Hastings station.

Apportioning the Cost of Joint Interlocking Plants.

The Illinois Railroad Commissioners have issued a pamphlet giving their decisions in the recent cases which they have adjudicated under the law of 1901 prescribing the use of interlocking signals at grade cross-

tion according to seniority, the Alton being the oldest road. It is claimed that the principle of seniority applies because the statute prescribes it in cases where a new crossing is desired hereafter. The other two roads desired the first cost to be apportioned equally and the expenses of operation according to the number of trains. Another basis proposed to the Board was that each company should pay in proportion to the number of main tracks, which rule has been applied by the commissioners in one previous case. Still another proposed plan was to assess the cost in proportion to the number of levers of which each company receives the benefit. The commissioners discuss these propositions at considerable length, but finally decide that each company must pay one-third of the original cost and one-third of the maintenance. They throw out the argument based on seniority, because, they say, it must be assumed that the settlement of damages when the oldest road was originally crossed by the new comer must be now regarded as having been final and not to be re-opened. The seniority theory would be impracticable in cities where a single interlocking plant may cost say \$50,000, which the youngest road would, of course, be too weak to pay. For the roads to pay in proportion to the number of trains would often be grossly unjust, as where one road has 100 trains a day and the other, say, half a dozen. Under this rule the basis of apportionment would constantly fluctuate. Dividing by the number of tracks must also often be inequitable, as an important road might have few tracks at a crossing, while a poor road might be under the necessity of having a large number at that particular point. If the commissioners were to decide the expense according to the number of levers in this case, the Illinois Central, deriving the least benefit from the machine, would have to pay the largest share, for the plan provides 13 levers for that road, 12 for the Alton and eight for the Wabash. The commissioners are satisfied that if they were compelled to adopt an inflexible rule for all cases it ought to be on the basis of an equal share to each company.

Railroad Building In 1891.

Our usual summary of the railroad building of the year is given in this issue, with an attempt, necessarily not so complete, and of less comparative value, at a forecast of the lines on which the construction of the present year is to be carried on. The table, being made up before the close of the year, does not include complete returns from several companies which do not have statistics ready until January. A supplemental list of additions will be published in this month. Following is a table of the new mileage by states:

Alabama	175.1	Oklahoma	57.7
Arkansas	68.5	Oregon	53.8
California	151	Pennsylvania	241.7
Colorado	147.1	Rhode Island	4
Florida	55	South Carolina	186
Georgia	212	South Dakota	92.1
Illinois	30.1	Tennessee	165.7
Indiana	68	Texas	182.2
Iowa	17.6	Utah	79
Kansas	28.4	Vermont	19.5
Kentucky	1.4	Virginia	162
Louisiana	39.3	Washington	232.2
Maine	184.1	West Virginia	10.2
Maryland	6	Wisconsin	111.9
Massachusetts	7.8	Wyoming	58.4
Michigan	97.4	Total U. S.	4,911.5
Minnesota	111.6	Alberta	151.5
Mississippi	196.2	British Columbia	90
Montana	45	Manitoba	21
Nebraska	10.5	New Brunswick	90.5
New Hampshire	17.5	Nova Scotia	7
New Jersey	57.3	Ontario	70.3
New Mexico	19.5	Quebec	55
New York	164.3	Mexico	359.9
North Carolina	103.9		
North Dakota	101.3	Total Foreign	482.2
Ohio	131.7	Grand total	4,815

Train Accidents in the United States in November.

COLLISIONS.
REAR.

1st, on Cincinnati, New Orleans, & Texas Pacific, at Oakdale, Tenn., a freight train standing in the yard was run into by a following freight, damaging engine, caboose and one car. It is said that the engine man was asleep, but that he used the air brake, which he had connected to seven cars, in season to mitigate the severity of the collision materially.

2d. on Cincinnati, New Orleans & Texas Pacific, at New River, Tenn., a freight train was run into at the rear by an empty engine which became uncontrollable on a descending grade. The brake rigging of the engine and one eccentric had been broken some time previously and the engine was running with one side; in going down the grade the engineman in attempting to stop it by regulating the speed disabled the other side and then was unable to stop.

2d, No. 45, ran on Richmond & Danville, at Danville, Va., freight train, No. 45 ran into the rear of a switching freight on a bridge over Dan River. A derailed coal car was thrown against the superstructure, breaking some of the side struts and causing the bridge to fall, the colliding engine and four cars going down a distance of 40 ft. One trainman killed and three injured, one of whom afterward died of his injuries.

3d, on Pittsburgh, Fort Wayne & Chicago, at Alliance, O., a passenger train ran over a misplaced switch and into the rear of a freight train entering a siding, badly damaging the engine and caboose and derailling several cars. Engineer and fireman injured by jumping.

4th, on Missouri, Kansas & Texas, near Waco, Tex., a freight train broke in two, and the hind portion was run into by a following stock train, making a pretty bad wreck, in which 4 drovers were killed and an engineer injured.

NEW RAILROAD CONSTRUCTION—JANUARY 1, 1891, TO JANUARY 1, 1892.

NAME OF ROAD.	Track laid between Jan. 1, 1891, and Jan. 1, 1892			Under contract or located.		
	From	To	Miles	From	To	Miles
Abbeville & Waycross.	Bowen's Mill, Ga.	Lula ville, Ga.	5.5	Lula ville, Ga.	Du Pont, Ga.	
Abingdon Coal & Iron.	Poland, N. Y.	North	4	Abingdon, Va.	Danascus, Va.	15
Adirondack & St. Lawrence.	Remsen, N. Y.	North	15	Poland, N. Y.	Malone, N. Y.	100
" " "	Tupper Lake, N. Y.	Saranac Lake, N. Y.	15	" " "	" " "	"
" " "	Malone, N. Y.	South	1	" " "	" " "	"
" " "	Malone, N. Y.	Valleyfield, Que.	31	" " "	" " "	"
Alabama Grand Trunk.	End of track	Cordale, Ga.	15	Montgomery, Ala.	Fairbury, Ala.	
Albany & Astoria.	Tagua, N. Y.	Frecks, N. Y.	2.3	Albany, Ore.	Astoria, Ore.	173
Albany, Florida & Northern.	Near Altoona, Pa.	Wopsononock, Pa.	5.5	Wopsononock	Coalport, Pa.	16
Albany & Kinzua.	Archer, Fla.	Early Bird mine	28	" " "	in Anderson, Ind.	2
Altamaha & Wopsononock.	Main line	Phosphate mines	5	Indian Bay, Ark.	Pine City, Ark.	12
Anderson Belt.	Asheville, N. C.	Toward Craggy Mt.	2	Arlington, Wash.	Monte Christo, W.	48
Archer.	Asylum, Cal.	Mentone, Cal.	6.7	End of track	Craggy Mt., N. C.	4
Arkansas Midland.	Fayetteville, N. C.	End of track	13	End of track	" " "	"
Arlington & Monte Christo.	Latta, N. C.	End of track	5	Washington, N. C.	Rebel, N. C.	30
Asheville & Craggy M.	" " "	" " "	"	Hager, N. C.	Hager, N. C.	18
Atchison, Topeka & Santa Fe:	Milford, Pa.	Stone quarries	3	Augusta, Ga.	Murray Hill, Ga.	7
A-tlantic California.	Near Warwick, O.	Chicago Junc., O.	30	Landon Sta., Balt.	Bayview Junc., Md.	
Atlantic Coast Line.	" " "	" " "	"	Uniontown	Morgantown, W. Va.	22
" " "	" " "	" " "	"	" " "	" " "	"
Augusta Belt Line.	" " "	" " "	"	Brownville, Me.	Fresque Isle, Me.	135
Baltimore Belt.	" " "	" " "	"	Bath, Me.	Phillipsburg, Me.	13
Baltimore & Ohio.	" " "	" " "	"	Boardsville, Vt.	Pomfret, N. H.	65
Akron & Chi. Junc.	" " "	" " "	"	Jamison C., Pa.	Ganoga Lakes, Pa.	15
Bangor & Aroostook.	" " "	" " "	"	" " "	" " "	"
Beardstown, Ft. Madison & S. C.	" " "	" " "	"	Boothbay, Me.	Newcastle, Me.	13
Bear Lake & Eastern.	" " "	" " "	"	Fells Sta., Mass.	Stoneham, Mass.	3
Bellinghay & Brit. Columbia.	" " "	" " "	"	" " "	" " "	"
Bergen Neck.	" " "	" " "	"	Bridgeport, Tex.	Deatur, Tex.	11
" " "	" " "	" " "	"	" " "	" " "	"
Birmingham & Jones Valley.	" " "	" " "	"	" " "	" " "	"
Black River.	" " "	" " "	"	" " "	" " "	"
Bloom-hury & Sullivan.	" " "	" " "	"	" " "	" " "	"
Blue Mountain Mineral.	" " "	" " "	"	" " "	" " "	"
Bonham Rapid Transit.	" " "	" " "	"	" " "	" " "	"
Boothbay.	" " "	" " "	"	" " "	" " "	"
Boston & Maine.	" " "	" " "	"	" " "	" " "	"
Boston Lithia Springs Short Line.	" " "	" " "	"	" " "	" " "	"
Bridgport & Decatur.	" " "	" " "	"	" " "	" " "	"
Bristol.	" " "	" " "	"	" " "	" " "	"
Bristol Belt Line.	" " "	" " "	"	" " "	" " "	"
Bristol, Elizabeth & N. C.	" " "	" " "	"	" " "	" " "	"
Brooklyn, Westpt & S. Ste. Marie.	" " "	" " "	"	" " "	" " "	"
Brookfield & Northern.	" " "	" " "	"	" " "	" " "	"
Brookline & Popperell.	" " "	" " "	"	" " "	" " "	"
Bruswick, Western & Southern.	" " "	" " "	"	" " "	" " "	"
Buffalo Dock & Connecting.	" " "	" " "	"	" " "	" " "	"
Buffalo, Rochester & Pittsburgh.	" " "	" " "	"	" " "	" " "	"
Cairo & Kanawha Valley.	" " "	" " "	"	" " "	" " "	"
Caldwell.	" " "	" " "	"	" " "	" " "	"
California & Nevada.	" " "	" " "	"	" " "	" " "	"
Camden, Watertown & Northern.	" " "	" " "	"	" " "	" " "	"
Canadian Pacific.	" " "	" " "	"	" " "	" " "	"
" " "	" " "	" " "	"	" " "	" " "	"
" " "	" " "	" " "	"	" " "	" " "	"
Calgary & Edmonton.	" " "	" " "	"	" " "	" " "	"
Columbia & Kootenai.	" " "	" " "	"	" " "	" " "	"
Shuswap & Okanagan.	" " "	" " "	"	" " "	" " "	"
Cape Breton.	" " "	" " "	"	" " "	" " "	"
Cape Fear & Yadkin Valley.	" " "	" " "	"	" " "	" " "	"
Carolina, Cumberland Gap & Chi.	" " "	" " "	"	" " "	" " "	"
Carolina Midland.	" " "	" " "	"	" " "	" " "	"
Carolina Min. & M'g. Co.	" " "	" " "	"	" " "	" " "	"
Central Counties.	" " "	" " "	"	" " "	" " "	"
Central of Georgia.	" " "	" " "	"	" " "	" " "	"
Mobile & Girard.	" " "	" " "	"	" " "	" " "	"
Centralia & Central City.	" " "	" " "	"	" " "	" " "	"
Centralia & Chester.	" " "	" " "	"	" " "	" " "	"
Central of New Jersey.	" " "	" " "	"	" " "	" " "	"
Vermont.	" " "	" " "	"	" " "	" " "	"
Chambersburg & Gettysburg.	" " "	" " "	"	" " "	" " "	"
Charleston & Savanna.	" " "	" " "	"	" " "	" " "	"
Charleston, Sumter & Northern.	" " "	" " "	"	" " "	" " "	"
Charlestown Belt.	" " "	" " "	"	" " "	" " "	"
Chattanooga Southern.	" " "	" " "	"	" " "	" " "	"
Chesapeake & Ohio.	" " "	" " "	"	" " "	" " "	"
Chicago, Burlington & Quincy.	" " "	" " "	"	" " "	" " "	"
Burlington & Missouri River.	" " "	" " "	"	" " "	" " "	"
" " "	" " "	" " "	"	" " "	" " "	"
" " "	" " "	" " "	"	" " "	" " "	"
Chicago & Eastern Illinois.	" " "	" " "	"	" " "	" " "	"
Chicago, Evansville & Champaign.	" " "	" " "	"	" " "	" " "	"
Chicago, Ft. Mad. & Des Moines.	" " "	" " "	"	" " "	" " "	"
Chicago & Grand Trunk.	" " "	" " "	"	" " "	" " "	"
Chicago, Indianapolis & Chata. Ro.	" " "	" " "	"	" " "	" " "	"
Chicago, Madison & Portage.	" " "	" " "	"	" " "	" " "	"
Chicago & New Orleans.	" " "	" " "	"	" " "	" " "	"
Chicago & Northwestern.	" " "	" " "	"	" " "	" " "	"
Chicago & West Michigan.	" " "	" " "	"	" " "	" " "	"
Choctaw Coal & Railway Co.	" " "	" " "	"	" " "	" " "	"
Cincinnati Circular.	" " "	" " "	"	" " "	" " "	"
Clev., Cin., Chicago & St. Louis.	" " "	" " "	"	" " "	" " "	"
Clarendon, Oklahoma & St. Louis.	" " "	" " "	"	" " "	" " "	"
Cleveland Belt.	" " "	" " "	"	" " "	" " "	"
Cleveland, Woodstock & Muskingum.	" " "	" " "	"	" " "	" " "	"
Colorado & Northeastern.	" " "	" " "	"	" " "	" " "	"
Colorado Southern.	" " "	" " "	"	" " "	" " "	"
Columbia, Newberry & Laurens.	" " "	" " "	"	" " "	" " "	"
Columbia River & Astoria.	" " "	" " "	"	" " "	" " "	"
Concord & Montreal.	" " "	" " "	"	" " "	" " "	"
Coos Bay, Roseburg & Eastern.	" " "	" " "	"	" " "	" " "	"
Carwallis Valley.	" " "	" " "	"	" " "	" " "	"
Covington & Louisville.	" " "	" " "	"	" " "	" " "	"
Croton Valley.	" " "	" " "	"	" " "	" " "	"
Dakota, Wyoming & Mo. River.	" " "	" " "	"	" " "	" " "	"
Danville & East Tennessee.	" " "	" " "	"	" " "	" " "	"
Delaware, Lackawanna & West'n.	" " "	" " "	"	" " "	" " "	"
Lackawanna & Montrose.	" " "	" " "	"	" " "	" " "	"
Delaware River & Lancaster.	" " "	" " "	"	" " "	" " "	"
Dela., Susquehanna & Schuylkill.	" " "	" " "	"	" " "	" " "	"
Denver, Lakewood & Golden.	" " "	" " "	"	" " "	" " "	"
Denver & Rio Grande.	" " "	" " "	"	" " "	" " "	"
Rio Grande & Gunnison.	" " "	" " "	"	" " "	" " "	"
Duluth, Mesabi & Northern.	" " "	" " "	"	" " "	" " "	"
Duluth, Pierre & Black Hills.	" " "	" " "	"	" " "	" " "	"
Duluth & Winnepig.	" " "	" " "	"	" " "	" " "	"
Duluth Transfer.	" " "	" " "	"	" " "	" " "	"
Duchesne County.	" " "	" " "	"	" " "	" " "	"
East Louisiana.	" " "	" " "	"	" " "	" " "	"
Easton & Northern.	" " "	" " "	"	" " "	" " "	"
East Tenn. Virginia & Georgia.	" " "	" " "	"	" " "	" " "	"
Johnson C. & Carolina.	" " "	" " "	"	" " "	" " "	"
Elgin, Joliet & Eastern.	" " "	" " "	"	" " "	" " "	"
Elleonsburg & North-eastern.	" " "	" " "	"	" " "	" " "	"
Emporium & Rich valley.	" " "	" " "	"	" " "	" " "	"
Fidalgo City Belt Line.	" " "	" " "	"	" " "	" " "	"
Fincastr & Cloverdale.	" " "	" " "	"	" " "	" " "	"
Findlay Belt.	" " "	" " "	"	" " "	" " "	"
Findlay, Ft. Wayne & Western.	" " "	" " "	"	" " "	" " "	"
Flint & Pere Marquette.	" " "	" " "	"	" " "	" " "	"
Florida, Georgia & Western.	" " "	" " "	"	" " "	" " "	"

NEW RAILROAD CONSTRUCTION—JANUARY 1, 1891, TO JANUARY 1, 1892.—Continued.

[illegible]

wrecked, and 9 passengers were killed, some of them being scalded by steam which escaped from a broken pipe on the engine. About 20 other passengers were injured. It appears that the F. & P. M. runner failed to keep a good lookout. This case was reported in the *Railroad Gazette* of Dec. 4 and 11.

28th, on Southern Pacific, 60 miles north of Ashland, Or., a freight train descending a grade broke in two, and the rear portion afterward ran into the forward one, wrecking several cars and killing a brakeman.

28th, on New York & New England, at Newington, Conn., an eastbound freight ran into the rear of a preceding freight, blocking the four main tracks of this and the New York, New Haven & Hartford road. The wreck took fire and several cars were burned up. One trainman fatally injured and 2 others less seriously. The second train seems to have been running too fast.

The second train seems to have been running too fast. 29th, on New York, Lake Erie & Western, near Parker's Glen, N. Y., a freight train ran into the rear of a preceding freight which had stopped for the purpose of cooling a hot journal. Five cars were badly wrecked and the engineer and fireman injured. It appears that a block signal operator admitted the second train to the section contrary to the rules.

And 19 others on 16 roads, involving 2 passenger and 3 other trains.

BUTTING.

2d, on Ohio River Railroad, at Mason City, W. Va., butting collision between a passenger train and a freight, disabling both locomotives. Two trainmen injured.

3d, on Western & Atlantic, at Kingston, Ga., a passenger train ran over a misplaced switch and into the head of a freight train standing on a side track, damaging both locomotives and a postal car. Four trainmen and 1 passenger injured.

5th, near Geneva, N. Y., butting collision between a Lehigh Valley passenger train and a New York Central & Hudson River freight train, wrecking both engines and damaging several cars in each train. Three trainmen slightly injured.

5th, on Buffalo, Rochester & Pittsburgh, near Havlin, N. Y., butting collision between a westbound passenger train and an empty engine, damaging both engines and an express car. The baggageman was thrown out of his

an express car. The baggageman was thrown out of his car and badly bruised. It is said that the runner of the empty engine had confused his orders and run past the meeting point.

8th, on Great Northern, at St. Cloud, Minn., butting collision between a train carrying employes of the road and a freight train. Both engines, one coach and several freight cars were wrecked. A number of employes were injured.

11th, on Illinois Central, near Medina, Tenn., butting collision between a passenger train and a freight train, many cars being badly damaged. Four trainmen were killed and a passenger fatally injured; the engineer and

15th, on Atchison, Topeka & Santa Fe, at Cone, Tex., butting collision of freight trains, killing a fireman and injuring an engineer. It is said that the northbound

17th, on Grand Rapids & Indiana, near Manton, Mich., butting collision between northbound freight No. 11 and southbound passenger No. 8 making a bad wreck and

southbound passenger No. 8, making a bad wreck and killing a fireman and a brakeman. The passenger engineer was fatally injured. The passenger train was a new one, just put on, and the freight crew forgot about it.

18th, on Chateaugay Railroad, butting collision between a passenger train and a wrecking train, due, it is said, to misunderstanding of orders. One engineer was killed.

18th, on Pennsylvania (Philadelphia & Erie Division), at Bardo, Pa., butting collision between passenger trains No. 15 westbound and No. 8 eastbound, badly damaging both engines and three or four cars. Engineer badly in-

both engines and three or four cars. Engineer badly injured and 3 passengers slightly. The collision occurred at the end of double track and train No. 8 approached at too high speed.

But, on Burlington & Missouri River, near German town, Neb., butting collision between passenger trains 41 and 42, wrecking the baggage cars and badly damaging the engines. Four trainmen injured. One of the trains was running contrary to orders.

21st, on Chicago, St. Louis & Kansas City, near Marshallton, Ia., butting collision between two freight trains, wrecking 20 cars. Six trainmen were injured.

collision between freight trains, one of which is said to have gone beyond the point at which it was ordered to wait. Fifteen cars and both engines were wrecked and 2 trainmen injured.

24th, on Chicago, Rock Island & Pacific, near Al-
berton, Ia., butting collision between freight trains, wreck
ing both engines. One engineer killed and 5 trainmen
injured. It is said that the eastbound train was run

24th, on Chicago, Rock Island & Pacific, near Ottumwa, Ia., butting collision between eastbound freight 42 and westbound 93, an engineer being killed and a fireman injured. It is said that the eastbound train was run contrary to a telegraphic order.

26th, at 5:30 a. m., on Delaware, Lackawanna & Western, at Messengerville, N. Y., collision between a north

ern, at Mesquiteville, N. T., collision between a northbound passenger train and a southbound freight train wrecking the engines and overturning the first two cars of the passenger train. Four trainmen injured. It is said that the freight was running on the passenger

20th, on Louisville & Nashville, near Warrior, Ala., butting collision between a passenger train and a wrecking train, wrecking both engines and badly damaging

20th, on Southern Pacific, at Bayou Sale, La., butting

(Continued on page 12.)



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

Air brake makers and purchasers of air brakes ought to profit by recent experiences with several new designs and not invest too much on mere shop trials, or on trials on cars and in actual service either, unless these latter have been so extensive, so varied and so carefully conducted and observed that there can be no question of the correctness of the design and the accuracy of the workmanship. We are led to say this by the withdrawal for improvement (or something else) of some promising apparatus on which a good deal of money has been spent. Two or three such cases have happened recently, and have cost some one considerable money. The fact is the air brake has come to be what it is by a long process of development, and its present efficiency is the summing up of immense experience and study. The design and the dimensions of each part, and the relations of each part to all others are the result of the acute observation and intelligent study of years of actual performance, and the probabilities are very strong against the successful design and construction of a brake by anyone who is not a master of this accumulated knowledge, and there are very few people in the world who are masters of it. In fact it is probable that the true theory of the quick action is not understood by many men either in the mechanical departments of railroads or out of them. There are physical limits to the rapidity of the reduction of pressure in the train pipe and there is a very definite physical limit to the quickness of the action of the brake beyond which it is impossible to go so long as the mechanism is actuated by air alone. These limits are closely approximated now and may soon be reached, but that can only be done by skillful and scientific proportioning of the parts. We have heard it said that if a certain apparatus gives the quick action on a few cars the quick action can be got on many cars by the same design. Perhaps so; but it does not follow. And there could not be a much worse device than one which will go on quickly at the head of a train and slowly at its rear, for such action would make greater shocks than the triple valves of 1886 and 1887. This is but one of the possible defects to be looked for in a brake that has been tried in service only on short trains. In short we cannot put too strongly the importance, both to makers and to buyers, of knowing positively, from thorough trials in service, on 50-car trains, what a brake can do before putting much money in it.

In this issue appears our usual detailed table of the mileage of railroad built during the year just passed.

The total is subject to certain corrections, as several companies decline to report until after the end of the year, and we prefer not to estimate their work. The total will therefore be increased rather than diminished. As it stands it shows 4,012 miles for the United States. This is rather less than we had expected, for construction in the second half year was not carried on in the usual ratio to that of the first half. In the three years just preceding 34.2 per cent. of the year's construction was done in the first half. As in the first half of 1891, 1,610 miles were built, there should have been 4,700 miles built in the year had the rate been kept up. As it has turned out 40 per cent. of all the new construction of the year was done in the first half. In the early part of the year it looked as if a very little turn in the market for securities might start into activity a good many sound enterprises which were temporarily stopped; but in spite of the early promise of good crops and great prosperity the turn did not come soon enough to affect the year's building. The total for the year was the least since 1885. In fact, since 1878 there have been but two years, 1884 and 1885, when so little railroad has been built as in 1891. Poor's figures of increase of mileage do not represent the new construction, but the net increase; but they are close enough to the actual construction figures for all practical purposes of comparison, and we use them in the following table showing the increase for several years:

	Miles.		Miles.
1890.....	5,018	1889.....	5,146
1891.....	12,878	1890.....	5,498
1888.....	6,916	1891.....	4,012

The following table shows the percentage of the whole building which has been done in the various groups of states in the last three years. The groups are Southern States east of the Mississippi, Northern States east of the Mississippi, Southwestern States, including Kansas and Colorado, Northwestern States and Pacific Coast States.

	1889.	1890.	1891.
Southeastern.....	36	31	23
Northeastern.....	21	19	23
Northwestern.....	10	21	15
Southwestern.....	18	18	18
Pacific.....	12	9	11

The slight variation in these percentages for the three years is quite remarkable; and it is also remarkable that more than half of the building is still in the Eastern States.

Many of the deaths in the Hastings accident were from scalding—how many is not known now and may never be. The statement has been made in the newspapers, and has been circumstantially corroborated by the statements to us of a man who has investigated the matter, that the escape of steam and hot water was from the breaking off of a check valve. On the other hand, an employe of the Motive Power Department, who examined the engine within less than an hour after the collision, says that neither the check valve nor any other opening of the boiler was broken or materially damaged. The officers of the road believe that the passengers who suffered from burns were either pinned against the boiler or else were thrown close to the safety valves. We called attention July 17 and 24 to the danger (obvious to anyone) of the use of the ordinary methods of attaching injector pipes. This was on the occasion of the Aspen Junction collision in which nine persons lost their lives, all of whom were scalded to death by the hot water and steam escaping from a locomotive, the check valve of which had been knocked off. The present case again calls attention to the fact that an inside check does away with this source of danger.

Block Signals on the New York Central.

The chief lesson of the rear collision on the New York Central & Hudson River, on Christmas eve, by which 12 persons lost their lives, seems to have been grasped at once by the general public and by some of the higher officers of the road who have heretofore shut their eyes to it. That very obvious lesson is that a road with a heavy and fast traffic ought to be run under the block system, even if a dividend must be passed in the year of the installation of block signals and reduced for the first year or two of their operation. We have so often and so lately had occasion to call attention to this lesson as applied to this road, that it would be superfluous to dwell upon it now, particularly as officers of the road have hastened to inform the public that block signals will be put in all the way to Buffalo "as soon as possible." It is a pity that this tardy decision should not have been taken before this dreadful and costly disaster happened and it is proper that the public should know

*See for instance *Railroad Gazette* Dec. 11, "A Group of Collisions," and Sept. 25, 1891, on the Montezuma accident (West Shore), when 15 passengers were killed; also the issues of Oct. 4 and Nov. 29, 1889, on the Palatine Bridge accident.

that the officers of the operating department are not responsible for the delay.

As long ago as the time of that other fatal and disgraceful rear collision, at Palatine Bridge Sept. 27, 1889, we had good reason to believe that the operating officers of the New York Central were fully aware of the pressing necessity of equipping that road with block signals, and that they were using their influence as urgently as seemed to them wise and useful to bring that about. Unfortunately those who controlled the expenditures of the road did not realize then how grave the situation had become, and possibly they were as ignorant of the state of the art as the newspaper interviews of the last few days indicate. This last we doubt, however. The responsible officers and directors must have known how effectually and economically block systems have been worked for years and years. If they did not they were strangely ignorant of the practice of their chief competitor and singularly blind to the experience of part of their own system. Therefore, the statements lately published that the company has been delaying only to learn what the best block signals are must be taken for what they are worth; and if they soften the indignation of the public they will have served their purpose.

It is quite true that trials have been made and are being made by the New York Central of the Hall, the Westinghouse electro-pneumatic and some recent modifications of the Sykes locks. But that only puts the matter back a few months. Years ago every one who was properly informed knew that it was perfectly feasible and would cost very little (considering the results) to put in manual signals to which the Sykes locks could be applied later if that was wished, or which could be replaced by the electro-pneumatic method if that were preferred. Such signals have been used for years, on thousands of miles of railroad, and have performed their office, not as surely, it is true, as if they had been interlocked one with the other, but still with great certainty.

Since the Palatine bridge accident the need of block signals must have become more and more apparent to all familiar with the conditions on the New York Central. While the total train mileage in the fiscal year of 1891 was not much increased over that of 1889, freight trains have been put on the passenger tracks and their speed has probably been accelerated; great efforts have been made to reach unprecedented speed with passenger trains; and for some reason accidents have lately followed each other in quick succession. On the Eastern Division especially the number of accidents in the last few months must have given the officers directly responsible for the operation of the road great anxiety. If it really has been decided at last to equip the whole road with block signals, they and the public are to be congratulated.

We said above that a road with a heavy and fast traffic ought to be worked under the block system even if dividends are passed or reduced for a while. The supposition with regard to dividends does not apply, however, to the case in hand. An officer of the road has said in an interview that the estimated cost of block signals with Sykes locking for the whole line to Buffalo is \$400,000 or \$500,000. This seems high, but even if it is correct and if it were all paid for out of one year's earnings it would not involve passing a dividend or come anywhere near it. In the four fiscal years 1888-1891 the total dividends paid were \$15,202,811, and this period included the year of the great strike. We question very much indeed if the cost of operating the block system would reduce the amount available for dividends; probably in the average of a few years the saving in the loss from accidents and in delays to traffic would actually increase the net earnings. At any rate it must be apparent to every one that the block signals must be put in, and that a road with the enormous business of the main line of the New York Central cannot afford to run its trains without other protection than that of the time table, the dispatcher and the flagman.

The New York Central Flagman.

The main and overshadowing consideration in the matter of the Hastings collision is that concerning the block system. This is discussed elsewhere in this paper. But the first question that comes up is that concerning the negligence of the brakeman, Edward A. Herrick. The interviews with officers of the road state that he was a man of good character, and that he had worked for the road one year. Five days after the collision the papers published a letter written by Herrick from his hiding place to his superintendent, in which he states that he put torpedoes on the rail, and that he left his red lantern outside when he went into the Hastings station. But we cannot learn that the officers of the road find any ground for believing this story about the

torpedoes, and the lantern was set close to the door, and not near the track, so that there is no likelihood that Herrick left it there as a measure of safety. The point of criticism is therefore quite obvious; for it may be said unhesitatingly that an experienced brakeman, of ordinarily trustworthy character, would in all probability have left his red light or a torpedo, or both, upon the track when he went into the telegraph office; so that lack of ordinary training is the simple explanation. Quite likely this collision may turn out to be in large degree a fruit of the strike of 1890, but that, after all, does not materially alter the force of this criticism. The question now is not concerning the propriety of hiring green men in 1890 but rather as to how they have been educated since then.

We do not say that old brakemen are always more careful than new ones, nor that there are not many who neglect flagging whenever they dare to, but if benefit can ever be claimed to result from experience, this is certainly an instance where the argument applies with peculiar force. We venture to say that the first criticism passed on this case by ninety-nine out of every hundred intelligent brakemen of five years' experience will be the one we have just mentioned. Every railroad man familiar with train work will recall numerous instances where brakemen of the more conservative and careful class have been seen to go away from the track a distance of several yards, or even rods, while on duty as flagmen, but he will recollect that they always fixed the flag or light near the rail before leaving. This is the most natural thing in the world in hot weather or on a stormy day, when it is desirable to seek shade or shelter and when there seems no risk in so doing; and, as we have said, the habit is a natural one with men who have had opportunity to learn by experience. This must be regarded as tending strongly to condemn the management of the road for manning an important passenger train with a brakeman of so limited experience. No one asserts that Herrick lacked conscientiousness.

It is often said that the change in a trainman's duty from that of a brakeman to that of a porter, which has taken place since the perfection of the air brake, has led to a change in the standard of selection and that many superintendents now look more particularly to a man's deportment and gentility than to his efficiency as a brakeman and flagman. This is doubtless true in many cases, though it would be more accurate to say that the *share* of the attention given to this matter is too large, proportionately, as compared with that given to the other qualifications. We do not know how true this may be of the Central's officers, nor whether its freight brakemen are all so boorish that they are not fit to be put on passenger trains, nor whether the pay on the latter is so small that the freight men do not desire the promotion; but these must certainly be regarded as pertinent questions to be considered at the Railroad Commissioners' inquiry.

The *Railroad Gazette* has persistently advocated the more thorough instruction of trainmen, and the emphasis here placed on mere experience must not be taken to indicate that we ignore the value of strict discipline; but without regard just now to what railroads ought to do in the way of training their flagmen, we desire to emphasize what they have done. The great trouble with flagmen is that they will not go back. Their motives for this reluctance are partly bad—laziness or infirmity of moral perception; and partly not so bad—desire to keep with their own train and to expedite business. As long as superintendents find difficulty in making the rule the severity of the condemnation of the flagmen for not carrying it out must be more or less modified in every case. But when a man has once gone back, there is no explanation of such a neglect as Herrick's but simple ignorance. We do not say that failure to stay with his light and to swing it on the approach of a train should under any circumstance be excused, but simply desire to point out that ordinary compliance with the rule would in all probability have saved these dozen lives.

Proposed Reform in French Railroad Rates.

For a year or more it has been the intention of the French government to reduce its tax on railroad fares, provided the railroad companies would make reductions in the fares. The tax was in the first place 10 per cent. of the fare, but as the pressure on the treasury increased it was increased by 12 per cent. of the fare and the old tax. Thus the 10 centimes per kilometre first class which the company collected for itself was increased by 1 centime to pay the old tax, and then by 1.32 centimes to pay the new one. Thus, when you pay for a ticket in France, the company collects for the state a sum equal to 23.2 per cent. of what it collects for itself. On a journey as long as that between New York and Chicago, the first class passenger pays \$29.10 to the company and \$6.75 tax to the state.

Whenever the railroad companies have been urged to reduce their fares, which are higher than in any other great country on the continent, they have replied that they could not hope for much growth of travel by such a reduction so long as the high government tax remained. A committee having the matter in charge has now reported a bill by which the tax is reduced from 23.2 to 12 per cent. in connection with a reduction of second and third class fares by the railroads. This would make for ordinary tickets the fares and the tax per kilometre in centimes as below:

	1st class.	2d class.	3d class.
Fare.....	10.00	6.75	4.40
Tax.....	1.30	0.81	0.528
Total.....	11.30	7.56	4.928

The reduction made by the railroads is thus nothing on the first class (which probably pays better in France than in any other European country), 10 per cent. on the second class and 20 per cent. on the third class. This makes a reduction in the total price of a ticket amounting to more than 24 per cent. on the third class, 18 per cent. on the second, and only 9 per cent. on the first.

The reductions made by the companies on return tickets, however, are not to be so great by the new bill as by the present practice, by which it is 25 per cent. for all classes alike. The new bill proposes that there shall be a reduction of 25 per cent. on the rate per kilometre for first class tickets as before, but on the second and third class tickets only 20 per cent. The fare and tax at present and as proposed are, in cents per mile:

	Single Tickets.	Round-trip Tickets.
	1st class. 2d class. 3d class.	1st class. 2d class. 3d class.
Proposed..	3.472 2.314 1.524	2.601 1.755 1.222
Present...	3.819 2.861 2.101	2.861 2.118 1.579

This puts the fares more nearly on a level with those which have long prevailed in Germany, but will doubtless be greatly reduced soon. A very large increase in travel might be expected in France from a large reduction in fares, but in any such case it is impossible to estimate beforehand what the effect will be. The committee of the French Congress estimates that for the first year the proposed changes will result in a reduction in the produce of the government tax amounting to 55,000,000 francs, and of 42,000,000 francs in the receipts of the railroads.

The same bill proposes a change in the rates on express freights in shipments of 40 kilograms (88 lbs.) or more, which heretofore has been uniformly 35 centimes per ton per kilometre, plus a government tax of 8.352 centimes, the total being equal to 12% cents per 2,000 lbs. per mile for all distances. By the new bill there are two classes of express freight goods, the second including food staples, which will pay one-fourth less than the other, which includes all other articles. Moreover, the charges are to decrease with the distances, and are greatly reduced for the shortest distance, being 32 and 24 centimes per ton for the first 100 kilometres (against 41% at present). The charges for a kilometre ton (2,204 lbs.) for different distances will be, in francs:

Proposed:	100 km.	200 km.	400 km.	600 km.	800 km.	1,000 km.
Ordinary.....	32	62	120	174	220	258
Food.....	24	46% 45	90	130% 129	165	193% 193
Present (old).	44	88	176	264	352	440

The proposed rates are equivalent to 41 cents per 100 lbs. for provisions, and 55 cents for other goods for distances of 125 miles, and \$1.45 for provisions and \$1.93 for other goods for 500 miles—something like the distances from New York to Buffalo and Pittsburgh, or from Chicago to Omaha and Kansas City.

Finally, there is a somewhat similar change for express parcels, weighing 40 kilograms or less, which are paying, including tax, at the rate of 55 centimes per ton per kilometre = 15.4 cents per ton per mile. These shipments are to continue of one class, but the rates will vary with the distances, making the total charge for a package of 20 kilograms (44 lbs.) in francs.

	100 km.	200 km.	400 km.	600 km.	800 km.	1,000 km.
New	0.70	1.40	2.66	3.85	5.06	6.29
Old	1.10	2.20	4.40	6.60	8.80	11.00

That is, a package of 44 lbs. or less is to go 62 miles for 14 cents, 249 miles for 52 cents, 373 miles for 75 cents, 500 miles for 98 cents and 621 miles for \$1.20. Smaller parcels usually go by mail. In this express traffic, which, however, does not go by the fastest trains, a very large increase may reasonably be expected by a decrease in rates. Within about 600 miles of Paris, on the Mediterranean coast, great quantities of vegetables and flowers are matured during the winter months, for which there is a market in the north, especially in Paris and London, which has scarcely any other limit than the price in those markets, the larger part of which, in most cases, is made by the cost of transportation. But this is probably only a fraction of the traffic which will move at express speed if rates permit.

November Accidents.

Our record of train accidents in November, given in this number, includes 112 collisions, 110 derailments and 4 other accidents, a total of 226 accidents, in which 69 persons were killed and 207 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

	Rear.	Butt.	Crossing.	Total.
COLLISIONS:				
Trains breaking in two.....	8	1	2	11
Misplaced switch.....	12	1	2	14
Failure to give or observe signal.....	1	1	1	3
Mistake in giving or understanding orders.....	15	1	1	17
Miscellaneous.....	15	2	6	23
Unexplained.....	11	11	19	41
Total.....	51	29	29	110

	Rear.	Butt.	Crossing.	Total.
DERAILMENTS:				
Broken rail.....	6	1	1	8
Loose or spread rail.....	5	1	1	7
Defective bridge.....	1	1	1	3
Defective switch.....	4	1	1	6
Broken wheel.....	5	1	1	7
Broken axle.....	7	1	1	9
Broken truck.....	4	1	1	6
Fallen brake beam.....	3	1	1	5
Broken car.....	1	1	1	3
Broken coupling.....	1	1	1	3
Fallen brake rod.....	1	1	1	3
Total.....	41	11	19	71

	Rear.	Butt.	Crossing.	Total.
OTHER ACCIDENTS:				
Boiler explosion.....	1	1	1	3
Broken side rod.....	1	1	1	3
Other causes.....	1	1	1	3
Total.....	3	3	3	9

Total number of accidents..... 226

A general classification shows:

	Col- lisions.	Derail- ments.	Other acc'd ts.	Total.	P.c.
Defects of road.....	16	1	1	18	7.9
Defects of equipment.....	8	21	3	32	14.1
Negligence in operating.....	63	16	1	80	35.3
Unforeseen obstructions.....	17	1	1	19	8.4
Unexplained.....	41	49	1	91	40.2
Total.....	112	110	4	226	100

The number of trains involved is as follows:

	Col- lisions.	Derail- ments.	Other acc'd ts.	Total.
Passenger.....	34	25	2	61
Freight and other.....	114	79	2	195
Total.....	178	114	4	296

The casualties may be divided as follows:

	Col- lisions.	Derail- ments.	Other acc'd ts.	Total.
KILLED:				
Employees.....	35	9	2	46
Passengers.....	15	2	1	18
Others.....	1	1	1	3
Total.....	51	16	4	71
INJURED:				
Employees.....	102	29	3	134
Passengers.....	46	18	1	65
Others.....	4	1	1	6
Total.....	152	51	5	208

The casualties to passengers and employes, when divided according to classes of causes, appear as follows:

	Pass. killed.	Pass. injured.	Emp. killed.	Emp. injured.
Defects of road.....	2	7	2	2
Defects of equipment.....	1	1	1	5
Negligence in operating.....	15	49	37	104
Unforeseen obstructions and maliciousness.....	1	2	3	19
Unexplained.....	4	4	4	13
Total.....	17	64	46	134

Twenty-four accidents caused the death of one or more persons each, and 50 caused injury but not death, leaving 132 (58 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with November of the previous four years shows:

	1891.	1890.	1889.	1888.	1887.
Collisions.....	112	111	75	71	73
Derailments.....	110	90	73	70	48
Other accidents.....	4	3	3	4	4
Total.....	226	204	151	145	125
Employees killed.....	46	44	29	25	26
Others ".....	23	22	13	13	13
Employees injured.....	134	125	90	103	87
Others ".....	73	140	77	73	18
Passenger trains involved.....	71	75	80	81	80

Average per day:

	1891.	1890.	1889.	1888.	1887.
Accidents.....	7.53	6.80	5.03	4.84	4.17
Killed.....	2.30	2.20	1.40	1.27	1.43
Injured.....	6.90	8.83	5.58	5.97	3.59

Average per accident:

	1891.	1890.	1889.	1888.	1887.
Killed.....	0.305	0.323	0.278	0.262	0.344
Injured.....	0.916	1.259	1.108	1.233	0.480

The worst accident of the month, that at Toledo, on the 28th, has been discussed in previous issues. The inspector of the Ohio State Railroad Commission is reported as having blamed the conductor and brakeman of the Lake Shore train, as well as the engineer of the Flint & Pere Marquette train, in this case; but we have seen no details of the evidence against the Lake Shore men. Of the other passengers killed in November only two were in passenger trains, one at Perry, N. Y., on the 17th, and one at Medina, Tenn., on the 11th. The Medina collision was one of those cases, no disgraceful to the American system of running trains, where forgetfulness by two or more men occurred coincidentally. It will be seen that there were no less than 14 other butting collisions during the month from this class of causes. The collision at Manton, Mich., on the 17th, was a marked and deplorable instance. Rear collisions, as well as butting, were very numerous in November. One of them, that at Parker's Glen, N. Y., on the 29th, seems to be what the English inspectors call a "failure of block working." Cases of this kind have been rare in this country for the reason that there has been comparatively little block working to fail; but we must, of course, expect them as the use of the system increases. No one claims that the block system changes fallible railroad men into infallible ones; but it should be always remembered that this inability to accomplish an impossibility in no way vitiates the claim that the block system, as a system, is many times safer than any other system of keeping trains apart.

Two derailments at interlocked crossings are recorded,

One of them apparently averted a crossing collision and seems to have been clearly the fault of the signalman. The rear collision at Betzwood, Pa., on the 4th, is reported in the *Philadelphia Times* as "the fifth of a series of big freight wrecks," a statement going to show why some train accidents do not get into the *Railroad Gazette*. The minor accidents are generally discovered by us only by reading local papers, and we occasionally learn from a report like this that ordinary accidents not occurring "in series" are not reported in print at all until a subsequent one in the same locality emphasizes the matter.

A Detroit paper is responsible for the statement that an engineer, fireman and conductor on the Grand Rapids & Indiana, who had become nervous on account of a butting collision on their road, were seriously injured by jumping off their engine when, on suddenly turning a curve, they came in sight of a fire near the track, which they mistook for the headlight of a train.

The derailment on the Mount Penn gravity road, Nov. 5, seems to have been due to general inefficiency, the management of cars on a steep and dangerous grade having been entrusted to employees not properly trained. It is said that a lack of sand on the track was a main cause of the speed getting beyond control. A young man had been employed to traverse certain portions of the road on foot and sand the rails, but it appears that his work had not extended over a sufficient length. Sand is usually carried on the train, but the supply was insufficient or wholly lacking on that day.

At Easton, Pa., on the night of the 10th, an electric street car became uncontrollable and was thrown into a river, injuring three or four persons. It is said that a lack of sand was also an important factor in this case. A collision of street cars in the La Salle street tunnel in Chicago, Nov. 19, resulted in the fatal injury of one passenger. Street cars were struck by locomotives in Salt Lake and in Chicago. The car in the latter case was overturned and a dozen passengers were mixed up with a stove full of hot coal. Of the numerous other accidents at street crossings in November at least a half a dozen resulted in the death of two or three persons each.

The Johnson Railroad Signal Co., of Rahway, N. J., which is putting in the mechanical and electrical apparatus for the operation of the block system on the New York Central & Hudson River road between Yonkers and Oscawana, as announced in these columns a few weeks ago, is to equip in the same manner the road from Peekskill drawbridge to Poughkeepsie, the contract for the additional work having been awarded by the road only a few hours before the Hastings collision. The completion of this work to Poughkeepsie will make a stretch of 73 miles out of New York protected by the block system. The details of the Johnson contract show that this will be one of the most perfectly equipped pieces of road in the country. As is well known, the action taken by most American companies in this direction has been somewhat illogical and fragmentary. Some block signals have been supplemented by adequate interlocking of switches but left without proper distant signals; some have been quite complete in other directions, but have been left without the support of interlocking, while still others have neither distant signals nor any system of switch protection. The Yonkers-Oscawana plan, however, shows adequate safeguards at every point. The block signals all have distant signals, so that there will be no call for unnecessary slackening of speed in times of fog. Every switch is under control of the signalmen, so that they will never be hampered by uncertainties as to whether conductors will carry out orders that have been given. The sections are only about 6,000 ft. long, so that there will be no rational excuse for permissive blocking. Electrical locking from each tower to the next will eliminate to the last degree the danger of error by the operators, and the non-use of permissive blocking will enable the company to utilize the electric safeguard *all the time*. The cost of this work indicates that the estimate given to a reporter by one of the officers of the road—\$500,000 for block signal apparatus throughout the line to Buffalo—is intended to cover equally thorough protection at all points, with, of course, longer sections where trains are less numerous. The Central has a road which affords really very favorable opportunities for this improvement. From Poughkeepsie to Albany the river on one side and the hills on the other make it really a "thin" road, and the yards and switches are infrequent. West of Albany the local passenger trains are few for so rich a road, and the slow freight trains have separate tracks by themselves, so that block sections three or four miles long will probably be adequate most of the way.

The New York *Herald*, in its inquiries about the Hastings collision, questioned General Superintendent Voorhees, as did the other papers, about the block system, and reports him as saying that he had been trying for several years to get the company to adopt it. Inasmuch as this very definitely shifts the blame for the dilatory course of the company from his shoulders to those of his superiors, some people have doubted the correctness of the *Herald's* report; but judging by Mr. Voorhees' general reputation as an operating officer it very likely tells the truth, whatever he may have said. The fact is that this illustrates a phase of

the Superintendent's life that is very familiar on a great many roads. The officer who has the direct management of those details which involve life and death has a continual contest with the ideas of the men who are more immediately interested in the dividends for this year. The great majority of railroad directors are men who, like Jay Gould, "look above and beyond details, to the earning capacity"; but they are subject to the limitations of humanity and do not make sufficient effort to look above and beyond the present. The most independent railroad manager of our acquaintance was one who had paid no dividends for 14 years and who said that he had got his stockholders sufficiently subdued so that they would not demand any for 14 years more. He paid his interest and the road did not fail; he simply put all the profits into the road. The Wabash road while under the Receiver was managed better and maintained more economically than ever before. We do not ignore the rights of the stockholder, of course; but these instances illustrate the point that the arguments of the manager who sometimes desires to postpone dividends are not to be lightly thrown aside. The Superintendent of another New York road said, confidentially, the other day, that he had begged and even implored for an appropriation for the block system on his road. He had not got the money, the last we knew, but we have heard of one road that suddenly ordered some block signals the next day after the Hastings collision.

The Illinois Railroad Commissioners have found some knotty questions in administering their new law about interlocking at crossings, and have made them public in a pamphlet, as noted in another column. It is not apparent, though, how their action can throw much light on similar cases elsewhere, or how others who have dealt with similar problems can give much aid toward fixing a settled rule in Illinois. The commissioners themselves have well said that each case must be considered in the light of its own peculiar circumstances. The fact is that an expense of this kind, though in a sense large, absolutely, must after all be treated as a minor item, as it really is. Neither side is warranted in haggling for exact justice. As in the case of highway crossings where a bridge imposes a burden on the railroad and on the town, either side can justly be content with more than its share of the cost, knowing that even then the benefit is worth more than it costs. A railroad which desires to run fast trains between cities 500 miles apart does not hesitate to spend money very freely in other directions to get a perfect road and to get business for the fast trains after they are put on; and instances are not wanting where, in pursuance of a policy of this kind, the towns and the smaller railroads have been given the easy end of the bargain voluntarily. If this policy has been sound in a business sense, as we must assume it has been, it cannot be that a board of commissioners, aiming to decide equitably, will impose a very serious hardship on any road. If the state could afford to apportion a fraction of the initial burden to itself, as Massachusetts has done in the case of highway crossings, it could easily enable the Commissioners to favor each party in every controversy instead of leaving each decision, as now, where all the contestants generally feel more or less aggrieved; and the fraction to be charged to the state treasury, which in the Massachusetts matter was a large one, need not in this case be more than a small one.

The Chicago & Alton has made all its tickets limited, and will limit them very closely, as will be seen from the announcement printed in our traffic column. This is a radical move, but the Chicago & Alton, being now independent of all associations, is in a position to take bold action, and it will be interesting to note the results of such a step on a road managed by men so well qualified to lay down a vigorous policy, and to pursue it with firmness and wisdom after it is laid down. As we remarked at the time of the proposal last winter to abolish unlimited joint tickets, the vital factor in the smooth working of a plan which is so much of a novelty to passengers is the prompt redemption of unused tickets. The general introduction on all roads of tickets which could not be treated as "good until used" would almost certainly stir up so many petty complaints that the success of the plan would be doubtful; but on a single road, where the officers are old in experience and young in their methods, we may expect to see the innovation tried under the most favorable conditions. Those managers who have stopped speculation of cash fares by the use of rebate checks and other means, but who still complain that their conductors sell tickets to scalpers, will notice that this scheme affords a good method of stopping that kind of robbery.

The Chicago & South Side Rapid Transit Railroad Co. is now pushing the "Alley" elevated road to completion. The money has all been subscribed to complete the road to Thirty-ninth street, together with all the equipment, stations, etc. This section of the road will, in all probability, be in operation by April 1, and there will be no further delay. The cars and locomotives will be ordered in about two weeks. The iron is on the ground for the remainder of the structure to Thirty-ninth street. All that is now needed is the completion of the stations and arrangement of the plan for operation. South of Thirty-

ninth street the specifications are being prepared for the material, and contracts will be made for it at once; hence, in spite of the many difficulties under which this road has labored in settling condemnation suits and obtaining the necessary funds, it is pretty sure to be carried through in time for the World's Fair. The feeling in Chicago toward this enterprise is very favorable; everybody knows that the money has been spent in a thoroughly business-like way, and that nothing has been wasted, and the scheme has the entire confidence of the business men of the city, who have invested largely in the bonds. It is now known that the money which is to finish this road has been raised almost entirely in Chicago.

NEW PUBLICATIONS.

Locomotive Engineering.—The first issue of this journal, the new form of the *Locomotive Engineer*, is that for January, 1892, and is just issued. As we have said before, Messrs. Angus Sinclair and John A. Hill are the editors and proprietors. The journal announces itself as a "Practical Journal of Railway Motive Power and Rolling Stock." About half of the first page is filled with a picture which is eminently practical. It shows a box car on top of a locomotive boiler; the running gear of the box car and various parts of the locomotive are piled up in the foreground. The whole scene is eminently practical, even to the graveyard in the distance, as Mr. Hill (we assume that it is Mr. Hill) suggests. There is a practical air also about the 15 pages of advertisements, which are interspersed with the 21 pages of reading matter. Certainly the contents of this first issue under the new management are varied and have a lively look, qualities which everybody would expect who knows the editors.

Messrs. John Wiley & Sons announce as in preparation a manual of experimental engineering, by Prof. R. C. Carpenter, Sibley College.

Compound Locomotives in Freight and Passenger Service.

BY ARTHUR T. WOODS.

The writer has been asked whether or not we may expect greater economy from compound locomotives in freight than in passenger service. Unfortunately, the records of compound locomotives in the two classes of work are too meagre as yet to furnish conclusive evidence on either side of the question, and we are therefore compelled, in attempting an answer, to theorize somewhat and to look to the records of other classes of multiple cylinder engines for facts in support of our arguments.

The difficulties which must be overcome in designing a satisfactory valve gear for compound locomotives are now well understood, and it will probably be generally admitted that the higher the rotative speed, the more difficult it becomes to obtain a satisfactory steam distribution. This is especially true when, as they must be in locomotives, with high speed and early cut-off, release and compression are contemporaneous. It would seem to follow that if we can reduce the speed of rotation within reasonable limits, other things being equal, a higher effective pressure for a given cut-off will result, and therefore greater economy. This means of course either larger driving wheels or a less number of miles per hour. Now a locomotive having 75-in. driving wheels makes the same number of revolutions per minute at a speed of 50 miles per hour as one having 54-in. wheels does at a speed of 36 miles per hour. If the latter is a freight engine and the former a passenger engine, the freight speed must evidently be lower than 36 miles per hour to show any advantage on this account. If our questioner schedules his freight trains at say 15 miles per hour, there is reason to believe that compounds will make a superior record in such service. But when freight trains are run at speeds of from 30 to 40 miles per hour, which are not unusual speeds, in some sections of the country at least, the rotative speed of freight engines of usual proportions will be nearly if not quite equal to that of the passenger engines having large driving wheels, and no better results can be expected in freight service on account of lower piston speed. When, however, the driving wheels of passenger engines are relatively smaller for ordinary speeds than those of freight engines, the freight engines should make the better records.

Another reason why a better showing may be expected in freight service is as follows: A: the average expansion in slow freight engines is less than in passenger engines, the gain by compounding should be greater in the former. That is, for example, if steam is cut off at $\frac{1}{2}$ stroke in the cylinder of a simple engine the gain by adding a low pressure cylinder of, say twice the original cylinder volume, and thus expanding four times instead of twice, is greater than it would be by adding a like low pressure cylinder to an engine cutting off at $\frac{3}{4}$ stroke, or increasing the expansion from three to six times.

What has been said thus far refers to the action of the engine solely. Turning now to the boiler, it is apparent that if we can supply the necessary steam with a less frequent exhaust, there is a prospect of more complete combustion, a lower smoke-box temperature and therefore less waste heat, and finally a more efficient boiler. Other things being equal, this can be

obtained by a lower rotative speed, and the slow speed freight locomotive thus has the advantage in this particular.

We see that there are several reasons why compound locomotives should give better results in slow freight than in passenger service, or that they should be more economical with heavy loads at low speeds than with light loads at high speeds. As has been said, data which would form conclusive testimony are wanting. More compounds have been built for passenger than for freight service, and reports of their work in passenger service are naturally more numerous. Further, the results are generally comparative, passenger with passenger, and freight with freight, and when the fuel and water saving only are reported it is not possible to determine whether each class of engine was equally well designed for its work. The reports of European tests show very nearly the same economy in the two classes of work, the average fuel saving from the reports at hand being slightly in favor of the freight engines. The published figures from the two-cylinder compounds on the East Tennessee, Virginia & Georgia railroad show much greater relative economy in passenger than in freight service, but particulars of the speed, etc., are wanting. More complete data of two tests of Vaucain compounds, are however, accessible. In the tests made by Mr. Barrus on the Baltimore & Ohio in the spring of 1890, the average fuel saving was 14.9 per cent. This engine had 66 in. driving wheels and the mean speed was about 236 revolutions per minute on express runs, the mean piston speed being about 1,024 ft. per minute. In Mr. Barrus' report on these tests the steam consumption of the compound per indicated horse power per hour is given at 19 per cent. less at 176 revolutions per minute than at 257 revolutions. In the recent tests of a consolidation compound of the same make on the Western New York & Pennsylvania railroad, the saving in coal was over 30 per cent., the average revolutions being about 115 per minute or the piston speed about 498 ft. per minute. The Johnstone compound in freight service gave 25 per cent. saving in coal, which is above the general average, at a mean speed of revolution of 141, or about 515 ft. per minute piston speed. Again, the tests of a Rhode Island compound on the Brooklyn elevated road, gave a fuel saving of 37.7 per cent. with a mean speed of about 160 revolutions per minute or 426 ft. piston speed. It will be seen that in all of these cases of exceptionally high percentage of saving the speed of revolution and piston speed are comparatively low.

The effect of forcing boilers is well illustrated by the tests of the boilers of the torpedo boat "Cushing." With natural draught the evaporation per lb. of coal from and at 212 degrees was 11.9 lbs. of water, while with air pressures of 0.5, 3.0 and 4.0 in. of water it was 9.72, 8.84 and 6.51 pounds respectively, the rate of combustion being, in the four cases, 7.58, 24.12, 40.23 and 66.32 lbs. of coal per sq. ft. of grate per hour. The "Cushing's" engines are quadruple expansion and are designed for a boiler pressure of 250 lbs. At a speed of 25.9 miles per hour and 370 revolutions per minute, or 925 ft. per minute mean piston speed, the consumption of coal was 2 lbs. per indicated horse power per hour, which, at the actual evaporation given for the boiler under nearly the same conditions, amounts to about 15 lbs. of water per horse power. The triple expansion engines of the Narragansett Electric Light Co., as tested by Messrs. Leavitt and Henthorn, used 12.94 lbs. of water per indicated horse power, with steam of 125 lbs. pressure at about 90 revolutions per minute, or about 793 ft. per minute mean piston speed. The experimental triple expansion engine at Owen's College (England) has a record of 1.33 lbs. of coal per indicated horse power at a mean piston speed of about 540 with about 200 lbs. boiler pressure.

It will be seen from these reports, which are selected on account of their reliability, that triple expansion engines at lower piston speeds, lower pressures, and with boilers which were not forced, gave superior results to a quadruple expansion engine with forced draught. Numerous other cases might be quoted, all illustrating the fact that engines of comparatively low piston speed and with boilers which are not forced are the most economical, but it is of course to be understood that cases in which the speed is reduced on account of lower boiler pressure, or reduced boiler capacity, are not included.

The conclusion which seems to be apparent from these figures is that a slower piston speed in locomotives will be followed by greater economy, the reasons being, apparently, a better steam distribution and less loss by wire drawing, and hence greater economy in the cylinders and greater boiler capacity in proportion to the cylinders, and hence greater economy in the boiler. As these requirements are more readily obtained in freight than in passenger service, the compound freight locomotive may be expected to do better work than the compound passenger locomotive, but whether or not the gain over the corresponding simple locomotives will be marked, is a question of how well these engines are fitted for the work which they are doing.

The Railroad Rates Question in England.

BY W. M. ACWORTH.

In an article on this subject, published in the *Railroad Gazette* on the 1st of May last, I ventured to prophesy that before the current session closed, Parliament would have deprived the leading English railway companies to

no inconsiderable extent of the revenue, on the faith of which the shareholders invested their capital. I added the further prediction that this action would cause not the slightest flutter in the timid breast of the capitalist, and that English railways would still continue to be able to borrow all the money they need at three per cent. The prophecy has, as it was bound to do, come true in both particulars.

How much the companies will have lost in net revenue by the reduction of powers which they are actually at this moment exercising, yet remains to be seen. At present, we can only say that, in not a few instances, where the railway companies gave evidence that at the moment they were exercising their statutory powers to the full and charging a rate of, say, one shilling, Parliament replied: "Then, in future, you shall only be allowed to charge eleven pence, or even ten pence." What proportion such cases bear to the whole goods' revenue of the companies, no man can tell. Probably by now the goods manager of each several company can make a shrewd guess how his own line is affected. But outsiders, whose only concern is with the general result, must wait to have their curiosity gratified till the new statutory maxima come into operation, which will not be till August, 1892, at the earliest. Meanwhile, it is pretty safe to say that the effect on the companies' dividends will be very trifling, and that the revolutionary proceeding—for, considering the matter in the abstract, it is a revolutionary proceeding to take private property compulsorily, without compensation, for public use—has had absolutely no effect on the imagination of the Stock Exchange. Two of the companies affected have 3 per cent. debentures. Those of the London & Southwestern are quoted to-day at 99 to 101; those of the Midland at 100 to 102: The four per cent. debentures of the other companies are quoted at about 130. Their ordinary stock fetches, as before, a price which leaves the purchaser only about four per cent. on his purchase money.

I have spoken of the action of Parliament, but it is as well to say at the outset that Parliament made practically no attempt to deal with the question itself. It is true that one or two quite unjustifiable, or at least unjustified, reductions in the rates of a single company were hastily made for political reasons when the bills reached the House of Commons in what was supposed to be their final form. But the whole of the serious work was done by a joint committee of ten members, five from each house, which devoted 48 days to the consideration of the matter. Of that committee the Duke of Richmond acted as chairman. He came to the post with the reputation of being one of the best and most experienced men of business in the country, and that reputation his conduct of the inquiry, if possible, heightened. No attempt was made to reopen the whole matter afresh. The proposals of the Board of Trade, the effect of which has been already given in the *Railroad Gazette*, were assumed by the committee to be reasonable and proper, unless where specific objection was taken to them, either by the railway companies on the one side or by those who claimed to represent the interest of the shippers on the other. All objections were required to be printed and handed in in advance, and in order that the point at issue might be defined as precisely as possible, the objection had to be framed in the form of an amendment to the Board of Trade draught bill. A railway company, let us say for example, moved to leave out one shilling and insert fifteen pence; the rival amendment of the traders also proposed to leave out the shilling but to insert in its stead nine pence. But spite of all efforts to shorten the inquiry, it extended, as has been said, over 48 days and was only with difficulty concluded in time to allow the act to be passed before the prorogation of Parliament.

It is perhaps worth mention, as illustrating the extraordinary aversion which English people have to abstract discussion, that from first to last not a word was said as to the economic basis on which railway rates schedules ought to be constructed. Evidence was given at enormous length as to what charges were being actually paid, as to whether those charges were more or less than ordinarily profitable; but of the reasons which explain the difference between the scale of charges made to A, a seaport, and B, an inland town, not one word was ever heard.

But it is time to descend from the general to the particular, and inquire on what principles the committee acted, and what results they deduced from them. One of the principles which, so far as an outsider could judge, had most weight with the committee was this: Big men can take care of themselves; statutory maxima are mainly intended for the protection of the small trader or the local agriculturist. Regarding the matter from this point of view, the committee spent hour after hour in patient investigation into the questions what were reasonable rates for hay and straw and timber; and what was a proper minimum load of these commodities per truck. It laid down too with the utmost minuteness a rate for return empties and for small parcels, while it struck out without much hesitation special rates for consignments in truck load and train load quantities, and made short work of the suggestion that it should incorporate into the act of Parliament, for the benefit of the millionaire coal owners of the Wigan district, rates below the Board of Trade scale, which the Northwestern Railway had pledged itself to maintain in force in order to secure the benevolent neutrality of so influential an in-

terest. Another principle of the committee appears to have been—and it is difficult for a reasonable man to question its justice—that while powers granted by Parliament half a century back in the infancy of railroads might be amended or abridged without hesitation in the light of more mature experience, powers granted by modern acts, under modern conditions, should not lightly be tampered with. As an example, it may be mentioned that the Midland Railway, which had obtained power by an act of 1881 to charge a minimum of 6d. per ton for the hire of coal trucks—in England, trucks for the conveyance of coal are not as a rule supplied by the railway company, and if they are an extra charge is made—preserved those powers unimpaired, while other companies, with no such act in their favor, were compelled, for distances under 20 miles, to content themselves with a maximum of 4½d. per ton. Again, the Board of Trade had done its best to make the maxima for the different classes uniform throughout the kingdom. In several instances—some of them of the utmost importance to the localities affected—the committee deliberately sacrificed uniformity in order to re-enact the exceptionally advantageous rates which particular districts—South Staffordshire, for example—had obtained under the provisions of old railway acts.

In fact, it may be said that, though the companies have come out of the struggle with, broadly speaking, undiminished revenues, they have unquestionably emerged with vastly diminished powers. Hardly in a single instance have their charging powers been increased; where before they were low enough to keep down the rates which might otherwise have been charged, they have been kept at their old level. Where, on the other hand, they were high and left a margin above actual rates, the margin has been relentlessly cut away. I must reserve for a second letter an attempt to sketch the outline of the new rates schedules in their final form.

Foreign Commerce of 1891.

From the Report of the Chief of the Bureau of Statistics, on the foreign commerce of the United States for the fiscal year ending Jan. 30, 1891, we gather some facts.

The value of the exports and imports of merchandise for the last fiscal year was \$1,720,307,006, which was \$184,355,032 greater than our foreign commerce in 1881, and \$82,257,913 greater than in 1890, making it the year of greatest aggregate imports and exports, though the value of the exports, \$884,480,810, is nearly \$18,000,000 less than 1881. The balance of trade was in our favor by \$39,564,614. The excess of exports of gold and silver over imports was \$72,604,195. Of this \$68,130,087 was gold. We must go back to 1884 to find so large an excess of gold exports. From 1847 to 1875, both inclusive, our exports of gold exceeded our imports by very nearly \$500,000,000. Since that our imports of gold have exceeded our exports by a little over \$78,500,000. Every year except 1847 and 1892 we have been heavy exporters of silver, sending out over \$58,000,000 in 1887, and \$59,000,000 in 1890.

Our largest commerce before the war was \$697,192,176 in 1860, or but little more than one-third of that of last year, when our trade with the United Kingdom of Great Britain and Ireland was within less than \$51,000,000 of our total exports and imports in 1890. In this time our imports have increased by 139.0 per cent. and our exports of domestic merchandise by 175.9 per cent. The imports from Europe have increased by 112.1 per cent. and our exports by 189.2 per cent. The United Kingdom took 52.5 per cent. of our exports in 1890, as against 50.6 per cent. in 1891, while 39.2 per cent. of our total imports came from there in 1890, against 23.1 per cent. in 1891.

In 1890 our exports classed as products of agriculture formed 81.1 per cent. in value of our total exports, and last year they contributed 73.7 per cent. Our products of manufacture were 14.4 per cent. of our exports in 1890 and 19.4 per cent. in 1891, while the products of mining, forestry, fisheries, etc., increased from 4.4 per cent. to 6.9 per cent. during this period. These percentages will probably be modified for the year ending with next June.

The wheat crop of the world for the four years ending with 1890 has averaged about 2,174 million bushels of 60 lbs. each, with an extreme variation during that time of about 200 million, or 10 per cent. The exports of wheat from Russia in Europe, British India, the Australasian Colonies, Argentine Republic and the United States for the past 11 years have been 2,280 million bushels, to which we have contributed 910 million, or 40 per cent. In 1890 we exported 60 per cent. and in 1888 20 per cent. The noticeable feature of the table from which these figures are taken is the increase in wheat exports from the Argentine Republic, from 42,829 bushels in 1880 to 12,022,795 in 1890.

Another Attempt to Stop Tall Buildings in Chicago.

At a recent meeting of the Chicago Underwriters' Association it was decided to increase the rate of insurance on tall buildings to such a figure as to prohibit their construction; \$3.15 per \$100 was fixed as the rate for tall buildings holding merchandise. The rate for office buildings was not settled upon. Immediately after the meeting the Press Association gathered opinions of owners and representatives of tall buildings about Chicago, the gist of which is just what might have been expected. The action of the Board of Underwriters will not affect tall office buildings, as the owners of most of

those buildings practically carry their own insurance. They reason thus: "We have been to a great expense to design and construct fireproof buildings. If they are fireproof when used as office buildings, what is the use of large insurance; if they are not fireproof, then why do we spend so much in their construction?" The fact is, the buildings are fireproof, as has been shown by several fires which have started in the Rookery Building and other buildings of the same kind in Chicago. There is nothing to carry the fire from one room to another. The walls are made of tiles, as well as the floors, and in several cases, where the entire office furniture has been burned up, no damage has been caused in adjoining rooms except discoloration from smoke. The conclusion has been reached by the agents of syndicates owning large buildings that it is only desirable to carry an amount of insurance sufficient to cover what damage may result from a local fire in the building. A few thousand dollars would do this, while the value of the building itself may be over two millions. It is a curious fact that every attempt to stop tall building construction in Chicago has been ineffectual, except, perhaps, the one of the city government limiting the height to 185 ft. for office buildings and 100 ft. for dwellings, warehouses and stores. Land is so valuable in the heart of Chicago and leases are so high that only tall buildings will pay. Those of ordinary height will not pay the interest on the cost and fixed charges.

Fast Run by a Vauclain Compound.

There has been considerable talk on the possibilities of fast running with the compound locomotive. Some have held that such engines are not fit for high speed. The following account of a run by a Baldwin compound on the Baltimore & Ohio, hauling a "royal blue" train from Philadelphia to Canton on the 22d inst. has a bearing on that question. The table shows the schedule time, the distance and the speed in miles per hour attained:

	Time, P. M.	Difference in time, Minutes.	Total miles.	Difference in distance, miles.	Schedule time, minutes.	Speed in miles per hour.
Philadelphia.....	1:40	..	..	..	1:35	..
Holmes.....	1:50	10	7.8	7.8	1:45	46.80
Chester.....	1:54	4	11.9	4.1	1:50	61.50
Boothwyn.....	1:59	5	16.5	4.6	1:55	55.20
Arrived Wilmington.....	2:07	48	25.1	8.6	..	..
Left Wilmington.....	2:09	..	..	..	2:05	10.75
E. Junction.....	2:13	4	27.6	2.5	2:10	39.50
Newark.....	2:21	11	37.2	9.6	2:20	52.36
Baldwin.....	2:29	5	41.2	4.0	2:24	48.00
Leslie.....	2:35	6	48.7	7.5	2:32	75.00
Jackson.....	2:41	6	54.5	5.8	2:37	88.00
East E. S. Bridge.....	2:43	2	56.4	1.9	2:40	57.00
West E. S. Bridge.....	2:46	3	57.6	1.2	2:43	24.00
Havre de Grace.....	2:47	1	58.6	1.0	2:45	60.00
Aberdeen.....	2:52	5	63.4	4.8	2:50	57.60
Van Bibber.....	3:00	48	72.0	8.6	2:59	10.75
Bradshaw.....	3:05	5	76.3	4.3	3:04	51.60
Cowenton.....	3:09	4	80.3	4.0	3:08	60.00
Rossville.....	3:13	4	84.5	4.2	3:13	63.00
Bayville.....	3:17	4	89.0	4.5	3:17	67.50
Canton.....	3:21	4	91.6	2.6	3:22	39.00

The time, including one stop at Wilmington and a slow-down at the Susquehanna bridge, requiring three minutes in crossing, was 101 minutes for 91.6 miles. A similar run was made on the 20th with six Pullman coaches. An observer on the train judged that the engine could have hauled two more cars with equal ease. Unfortunately no indicator cards were taken on this trip, and we cannot give the details of fuel consumption or steam distribution in the cylinders; but the fact that the engine made at times a speed as great as 67 miles per hour goes to show that there is no serious defect in compounds at high speed. A record has been obtained from this engine in one instance of a speed of 77 miles per hour, but the details of the run were not gathered. In another case a 10-wheel passenger and freight, engine with 62-in. wheels and 26-in. stroke, made 72 miles per hour. The 10-wheeler made for the Master Mechanics' Association Committee, with 72-in. wheels, hauled a fast train on the Baltimore & Ohio, and made up time with 11 coaches, and traveled 8.6 miles in 9 minutes over a grade of 42.6 ft. per mile.

Train Accidents in the United States in November.

(Continued from page 7.)

CROSSING AND MISCELLANEOUS.

1st, at the crossing at Olean, N. Y., owing to a mistake in signaling, a Western New York & Pennsylvania passenger train was run into by a New York, Lake Erie & Western freight train, wrecking the freight engine and the baggage and express cars. A switch tender was injured.

3d, on New York, Susquehanna & Western, near Hackensack, N. J., collision between a passenger train and a milk train, due to a misplaced switch. One end of a passenger car was torn away, injuring several passengers.

7th, 2 a. m., on Louisville, Evansville & St. Louis, at Edwinstown Hill, Ind., a stock train became unmanageable on a steep grade, by reason it is said, of the bursting of an air brake cylinder, and ran 6 miles into the New Albany yard, where it struck and upset a switching engine and, continuing, collided with a Pittsburgh, Cincinnati, Chicago & St. Louis freight train, demolishing both engines. Engineer and fireman severely injured.

7th, night, on Philadelphia & Reading, at Philadelphia, Pa., collision at a cross-over between a switching freight, the engine of which was pushing the cars, and a yard engine. The reversing lever of the latter was snapped off and the throttle opened by the shock and the engine ran through the yard at high speed unat-

tended, jumped the track at a curve and partially demolished an adjacent building. An engineer was fatally injured.

8th, 4 a. m., on Lehigh Valley road, at Sugar Notch, Pa., a freight train of 56 loaded cars which had become uncontrollable in descending the long grade from Penobscot, ran into the side of a switching freight, badly damaging the engine and derailling 59 cars. All the men had deserted the runaway except the engineer, who, however, got out of the wreck safely. It appears that the brakemen were not prompt in setting the brakes at the beginning of the descent.

9th, three miles east of Lafayette, Ind., a Cleveland, Cincinnati, Chicago & St. Louis freight train ran into the head of a Lake Erie & Western work train, which was backing on to a side track, overturning the locomotive of the former and damaging 15 cars. Four trainmen injured by jumping.

9th, on Central of New Jersey, near Hamburg, N. J., collision between two coal trains, making a very bad wreck, in which several employees were slightly injured.

10th, 11 p. m., on New York, Lake Erie & Western, near Middletown, N. Y., a freight train in backing into a siding already occupied by another opposite bound freight, collided with it, wrecking both cabooses, which took fire and, together with a carload of lumber, were burned up. A brakeman was killed.

10th, on Illinois Central, at Waterloo, Ia., two freight trains collided in the yard owing to a misplaced switch. A fireman was killed and an engineer injured.

15th, on Manitou & Pike's Peak, near Manitou Springs, Colo., a brakeman letting down a platform car, loaded with stone to couple it to the engine, failed to control the brake, and there was a collision in which he was killed.

20th, on Delaware, Lackawanna & Western, at Buffalo, N. Y., collision between switching trains in the yard, injuring an engineer.

24th, on Illinois Central, at Duquoin, Ill., collision between a freight and a switching train, killing a brakeman and injuring a conductor.

25th, on Baltimore & Ohio, near Utica, O., the engine of a freight train, which had been run some distance ahead to secure the right of road, collided with its own train on returning and the engineer and fireman were killed.

27th, at the Union Depot, St. Louis, Mo., a Wabash passenger train ran into a switching engine, derailing a passenger car and injuring 1 passenger.

30th, at the crossing of the East Tennessee, Virginia & Georgia and the Belt line, near Chattanooga, Tenn., the rear car of a Belt line train was struck and overturned by a train on the other road, injuring 4 passengers.

And 14 others on 14 roads, involving 3 passenger and 22 other trains.

DERAILMENTS.

DEFECTS OF ROAD.

2d, on Lehigh Valley, at Levanna, N. Y., a freight train was derailed at a defective switch and struck the engine of a passenger train standing on an adjoining track, damaging both engines and the forward cars of the passenger train. An engineer was badly hurt.

12th, on Union Pacific, near Julesburg, Colo., a freight train was derailed by a broken rail, 10 loaded cars being wrecked and a tramp injured.

12th, on Houston & Texas Central, near Hammond, Tex., a southbound passenger train was derailed by a broken rail, 4 passenger cars being overturned. Four passengers were injured.

16th, on Union Pacific, at Carbon, Wyo., fast eastbound passenger train No. 8 derailed, the tender and 2 baggage cars being overturned. It is said that a defective switch was the cause of the derailment.

17th, on Buffalo, Rochester & Pittsburgh, at Perry, N. Y., the rear car of a passenger train was derailed at a switch by a broken rail and thrown down a bank, one other car being pulled down with it. One passenger was killed and 1 passenger and 1 trainman injured. The wreck took fire, but the flames were soon extinguished. The passenger killed was a woman; she was stunned and the car in which she lay fell into a stream so that she was drowned.

18th, on Lake Shore & Michigan Southern, at Osceola, Ind., a westbound passenger train running at high speed was derailed by a defective switch. One passenger car was overturned and 2 passengers were injured.

28th, on Louisville & Nashville, at Escambia, Fla., a car in a freight train was derailed by a loose rail at a point where the ballast was deficient; the train ran some distance to a bridge, where 4 cars and the caboose fell into the water, killing 1 passenger.

And 9 others on 7 roads, involving 5 passenger and 4 other trains.

DEFECTS OF EQUIPMENT.

4th, on Pennsylvania Railroad, at Nineveh, Pa., some cars of a westbound freight train were derailed by a broken truck and thrown over against an eastbound freight train passing on the adjoining track, wrecking 13 cars.

4th, on Pennsylvania, at Longfellow, Pa., 17 cars of a freight train were derailed by the breaking of a wheel and wrecked. A brakeman was severely injured.

17th, on Richmond & Danville, at Salisbury, N. C., 6 cars of a freight train were derailed and wrecked by a broken axle. Two tramps were killed and another injured.

26th, on New York, Lake Erie & Western, near Lordville, N. Y., 5 cars of a freight train derailed by a broken truck and 2 trainmen injured.

30th, on East Tennessee, Virginia & Georgia, near Atlanta, Ga., engine and 3 cars of a westbound freight train derailed by a fallen breakbeam. One of the cars obstructed or damaged the eastbound main track and an eastbound freight train was derailed.

And 10 others on 13 roads, involving 1 passenger and 15 other trains.

NEGLECT IN OPERATING.

1st, on Atlantic & Pacific, at Franconia, Ariz., engine and 1 car freight train derailed at a misplaced switch, badly injuring the fireman. This freight was the second of two which set off on the sidetrack to meet a passenger train, and it appears that after the first had pulled out the switch was set for the main track and the engine of the next train was overturned on reaching the switch.

3d, on Chicago & West Michigan, at Grand Rapids, Mich., a freight train was derailed at a misplaced switch, wrecking 3 portion of the train and killing a tramp.

5th, 3 p. m., on Mount Penn Railroad (a line near Reading, Pa.), operated by pushing cars up to the summit of the mountain and allowing them to run down the other side without a locomotive, two cars became uncontrollable in descending the mountain, owing to the wet condition of the rails, and were derailed at a curve and dashed against therocks, the forward car being badly

wrecked. Two trainmen killed and 3 passengers injured.

14th, on Florida Southern, near Fort Meade, Fla., freight train derailed at a point where track repairs were in progress, one trainman being injured.

17th, on Lake Shore & Michigan Southern, at Albion, Mich., a southbound passenger train was derailed by the derailing switch at the crossing of the Michigan Central, about half the train running off upon the sleepers. It seems that the engineman did not heed the signals, which plainly indicated that the derailer was open.

18th, on Cleveland & Pittsburgh, at the crossing of the New York, Pennsylvania & Ohio, near Ravenna, O., a freight train was derailed by the derailing switch, wrecking engine and 8 cars. It is said that the operator was asleep on the approach of the train and on being awakened set the signals for a train on the other road without noticing that the C. & P. train was close by.

And 10 others on 10 roads, involving 2 passenger and 8 other trains.

UNFORESEEN OBSTRUCTIONS.

6th, 1 a. m., on Columbia & Puget Sound road, near Renton, Wash., engine of a freight train struck a cow, which had fallen into a cattle guard, and was derailed and overturned. The engineer was partly pinned under water by the engine and was rescued only after 13 hours' hard work. He was also badly scalded.

8th, on Western & Atlantic, near Smyrna, Ga., the engine and 2 forward cars of a passenger train were derailed at a curve, presumably by a rail which had been maliciously loosened. Engineer and fireman injured and a man stealing a ride killed.

11th, on Chicago, St. Paul & Kansas City, near Durango, Ia., 3 cars of a passenger train derailed by sleepers which had been maliciously piled upon the track. The train was running slowly and it is said that no persons were injured.

15th, on Union Pacific, near Sedgwick, Colo., westbound passenger train No. 5 derailed by a misplaced rail, which, it is said, had been maliciously tampered with. The locomotive was overturned.

18th, on St. Louis, Iron Mountain & Southern, near Swifton, Ark., freight train derailed by a steer, 9 cars being wrecked. A tramp was killed.

25th, on New York Central & Hudson River, near Jordan, N. Y., engine of a freight train derailed by running over a horse, killing the fireman and injuring a man who was learning to fire.

26th, on Cincinnati, New Orleans & Texas Pacific, near Boyce, Tenn., passenger train No. 8 derailed on an embankment at a point where a rail had been maliciously removed. Nearly the whole train went down a bank. The fireman was killed, 3 trainmen and 2 tramps injured. An attempt had been made to wreck No. 8 about two weeks before by the insertion of a spike in a rail joint on a high bridge.

28th, on South Carolina Railroad, near Sumter, S. C., passenger train derailed and thrown down a bank into a swamp, killing the fireman and injuring 2 passengers and 2 trainmen. It is said that a rail had been maliciously removed.

And 9 others on 9 roads, involving 5 passenger and 4 other trains.

UNEXPLAINED.

4th, on New York Central & Hudson River, near Irvington, N. Y., a car of a westbound freight train running on the middle track was derailed. The conductor jumped off and was immediately run over by a passenger train and killed.

7th, on Richmond & Danville near Toccoa, Ga., a freight train consisting of engine and three cars was derailed and overturned, injuring two trainmen.

9th, on Macon & Birmingham, near Woodbury, Ala., several cars of a freight train were derailed and tipped off a trestle, injuring a brakeman.

11th, 12:50 p. m., on New York, Lake Erie & Western, at Adrian, N. Y., a passenger train was derailed while running at high speed. The entire train left the track, the dining car and one coach going into an adjacent field. The engine was wrecked and the forward cars, including two coaches, were badly damaged. Fire broke out, and two cars were burned up. The engineer was killed, and the fireman, 3 other trainmen, and 6 passengers were injured.

13th, on Ohio Southern, near Whitman's, O., 10 cars of a freight train were derailed and badly damaged. A brakeman was fatally injured.

14th, on Pennsylvania, at Eagle, Pa., engine of a freight train derailed and overturned; engineer killed and 2 other trainmen injured.

14th, on Pennsylvania road, near Stratford, Pa., freight train derailed and engine killed.

15th, on Cincinnati, Hamilton & Dayton, at Lima, O., the engine of a passenger train was derailed and dragged the first two cars off the track, doing serious damage. Engineer and fireman injured.

27th, on Pittsburgh, Cincinnati, Chicago & St. Louis, near Mansfield, Pa., freight train derailed, injuring a brakeman.

30th, on the New York Central & Hudson River, at Niagara Falls, N. Y., a car in a passenger train was overturned at a switch, where the hind truck went the wrong way. The conductor was injured.

And 30 others on 21 roads, involving 7 passenger and 24 other trains.

OTHER ACCIDENTS.

13th, on Montana Union, near Garrison, Mont., engine of a passenger train badly damaged by breaking both side rods. Engineer and another man riding in the cab injured. It is said that the train ran over a mile before it was stopped by trainmen who crawled over the tender. The fireman was thrown upon the ground, but not badly injured.

17th, on Georgia, Carolina & Northern, near Abbeville, S. C., locomotive of a freight train wrecked by the explosion of the boiler, the fireman being injured.

23d, on Pennsylvania road, near Tyrone, Pa., a trunk in the baggage car of a passenger train exploded, setting fire to the car. The baggage was badly burned in trying to extinguish the flames. The trunk contained dynamite belonging to a miner.

27th, on Cleveland, Akron & Columbus, near Akron, O., locomotive of a freight train wrecked by the explosion of its boiler. Engineer and fireman killed.

A summary will be found in another column.

TECHNICAL.

Manufacturing and Business.

The buildings of the Bluffton Car Wheel Works, Bluffton, Ala., are about complete, and the works will soon go into operation.

The Chicago & South Side Rapid Transit Railroad Company has prepared specifications for cars and loco-

motives, and the contracts are to be let at once. So far as now known there will be 75 cars and 25 locomotives of the most improved pattern.

The Norfolk & Atlantic Terminal Co. has been incorporated by the Virginia legislature and given privilege to construct dry docks, elevators, turnpikes, etc. Among the incorporators are Barton Myers, Joseph T. Allyn, D. Lowenburg, R. H. Baker and others.

The Morgan Engineering Co., of Alliance, O., has erected altogether 32 cranes, and the increase of this branch of its business has been so great that a separate department has been erected for the construction of this kind of machinery.

The Perry Ventilator Co. has opened a New York office at 115 Broadway. Mr. L. F. Braine has been appointed general agent. He was for many years connected with Ramapo Iron Works.

The National Cordage Co. has acquired the works of John Good, at Ravenswood and at Brooklyn, N. Y. The plant is valued at nearly \$2,000,000. It is said that the only important concern now outside of the Trust is the establishment of E. H. Fittler & Co., of Philadelphia.

New Shops.

The Wheeling & Lake Erie has just finished work on its new shops at Ironville, near Toledo, as far as the buildings themselves are concerned. The company will receive its first consignment of machinery early in January, and the shops will be in operation by the middle of April.

Fall Shipbuilding on the Lakes.

There are now 45 vessels with a carrying capacity of 78,000 gross tons building and under contract to be ready at the opening of navigation in the lake shipyards. Their value is \$4,896,000. The value of the United States lake marine already built, as given at the Detroit convention, is \$62,000,000, to which might be added \$4,300,000 for the Canadian lake marine, making an aggregate valuation of over seventy million dollars. Of these 45 vessels now building 32 are of steel and 13 are of wood; and 40 of them are steamers.

The following table shows the work under contract on Dec. 1 for the years mentioned:

	Number of boats.	Capacity, gross tons.	Valuation.
1886.....	31	65,750	\$4,074,000
1887.....	60	108,325	8,325,000
1888.....	59	109,950	7,121,000
1889.....	56	124,750	7,866,000
1890.....	38	77,350	5,337,000
1891.....	45	76,940	4,591,000

Nearly all of the vessels to be built this winter are freight carriers; eleven of them with capacities varying between 3,000 and 3,700 gross tons.

In addition to the above, not included because it will not be ready at the opening of navigation, is the "straight back," to be built by the Detroit Dry Dock Co., which is intended to carry 5,000 tons on 16 ft. draught, and which will cost about \$225,000.

High Pressure Water System in Chicago.

Owing to the recent decision of the board of underwriters in Chicago regarding the need for a high pressure water system, it is probable that such a system will be built soon. It is expected that it will be carried out by a private corporation. The present pressure will not throw water anywhere near high enough for fire purposes, and generally there are pumps in the basements of the buildings to pump water to the tanks in the roofs. In large buildings where there are many hydraulic elevators, it is necessary to keep a large pumping plant. It is expected that the high pressure system will do away with this and reduce the smoke nuisance.

A New Cutting Tool.

Gould & Eberhardt, of Newark, N. J., are using an ingenious form of metal cutting tool for planers, shapers and lathes. The cutting edges are formed of small pieces of steel cut from a bar and are held by malleable iron holders to the proper angles. The tools do not require forging. The difficulty with most of such devices is that the cutters slip in the holders and the tools can not be brought as near to the piece to be operated upon as the ordinary forged cutting tool. It is claimed that in the new devices just mentioned these difficulties have been overcome.

The Movable Sidewalk.

The success of the movable sidewalk at Jackson Park has attracted considerable attention among engineers. It is now in operation daily, carrying a considerable number of passengers who wish to view the fair grounds and who have not a permit for entrance. Already propositions have been made for similar plants at several shore resorts, and the company is now prepared to do business.

Spikes and Tie Plates.

The New York Central & Hudson River Railroad has given to the Q. & C. Co. a very large order for the Davies steel lock spike, and an important order for the Servis tie plate. The rumor is that this spike will be adopted as standard by that company, and the recent orders placed are of such magnitude as to strengthen the probability of this rumor.

Interlocking.

The Johnson Railroad Signal Co., of Rahway, N. J., is to erect an interlocking plant for the Old Colony at Weir Junction near Taunton, Mass.

The Pullman Double Deck Electric Street Car.

We described in our issue of Oct. 16, p. 732, a new double deck street car put out by the Pullman Palace Car Co., which is not only handsome and well designed in detail, but has great seating capacity. The table below gives particulars of the loads carried by one of these cars on Dec. 13. The data are for four round trips between Harvard Square and Bowdoin Square, Boston; mileage made, 54 miles.

Trips.	Time.	Lower deck passengers.	Upper deck passengers.	Total.
First trip.	12:05 p. m.	88	85	173
Second "	1:20 p. m.	58	109	167
Third "	2:35 p. m.	136	154	290
Fourth "	3:50 p. m.	133	127	260
Fifth "	5:05 p. m.	73	108	181
Sixth "	6:20 p. m.	92	86	178
Seventh "	8:35 p. m.	57	102	159
Eighth "	9:10 p. m.	73	135	208
		710	908	1,618

Contract for Trainsheds of St. Louis Station.

The contract for the iron and steel work of the new Union station sheds in St. Louis has been let to the Pittsburgh Bridge Co. by the Terminal Railroad Association for about \$300,000. Dr. Taussig declined to state the exact amount of the contract for publication. The bids for the glass and tin work have not been awarded yet. The work is to be completed by Jan. 1, 1893. The sheds are to extend from the rear of the station building proper, which will face on Market street, between Nineteenth and Twenty-first streets, and run far down toward Clark avenue.

Car Couplers.

The Standard Car Coupling Co. is prepared to contract with railroad companies and guarantee to replace all its broken drawheads and 50 per cent. of its broken knuckles without charge, and also to guarantee that the breakages of the Standard coupler will not exceed the official records of breakages on the N. Y. C. & H. R. R. R., as published in the *Railroad Gazette* Dec. 18, page 902.

The guarantee of the McConway & Torley Co. is equivalent to replacing, free, 50 per cent. of the coupler castings and 75 per cent. of the knuckles.

Whalebacks for the Canadian Pacific.

The keels were laid last week in the West Superior yards of the American Steel Barge Co. for two of a fleet of six whalebacks under contract for the Canadian Pacific Railroad. These vessels will be of improved model, 320 ft. long, 42 ft. beam, 25 ft. depth, and will be of greater capacity and more swift than other whalebacks so far constructed.

THE SCRAP HEAP.

Notes.

A collision on Dec. 24, near Cuernavaca, on the Mexican Southern Railroad, resulted in the death of 12 persons.

Charles Morsey has been an engineer on the Wabash road for 30 years, but has resigned because his locomotive killed a man a few weeks ago. If all railroad employes and owners were as conscientious as Mr. Morsey we should have fewer accidents and deaths in railroad wrecks.—*Chicago paper.*

General Superintendent Sanborn, of the Chicago & Northwestern, has received as a Christmas present from Mr. J. J. Walton, Section Foreman of the road at Fort Atkinson, Wis., a handsomely turned cane made from a burr-oak tie which was placed in the main line at Fort Atkinson in 1859.

William Canfield, who was tried at New Lisbon, O., on the charge of wrecking the limited express of the Pittsburgh, Fort Wayne & Chicago, at East Palestine, O., several months ago, was acquitted Dec. 24. It is said that two detectives have been imprisoned for inducing Canfield, who is young, to drink liquor, and then extorting a fictitious "confession" from him.

The Flint & Pere Marquette has discontinued running its trains into Toledo, O., and they now end their trips at Monroe, Mich. It appears that the agreement under which that company used the Lake Shore tracks had been a subject of controversy for a long time and that after the occurrence of the collision Nov. 28 the temporary understanding under which the trains had continued to run was at once abrogated.

A Baltimore paper states that the Pennsylvania (Philadelphia, Wilmington & Baltimore) has just decided to abolish about 20 grade crossings in that city, spending \$1,000,000 in elevating the grade of its road. Among the streets to be changed are Gay, Wolf, East Preston, North Washington, East Biddle, North Chester, East Chase, North Collington, North Patterson, Park and North Berks. A new station will be erected at Biddle and Washington streets.

Railroad Commissioner T. J. Hennessey, of Missouri, has made an inspection of the St. Louis & Hannibal Railroad and publishes a detailed report of the poor condition of the track, specifying a number of bridges and trestles which need immediate repairs to make them safe. It appears that the Commission made an order on the road over two years ago, directing numerous specific repairs, and that a good deal of the work that was necessary has been done, but the Commissioners still hold that the condition of the road is not up to a safe standard.

Spanish American Notes.

The Argentine Government is carrying out a peculiar policy in its zeal to counteract the effects of its unfortunate system of interest guarantees upon railroad capitalization. By a law of congress funding or moratorium bonds were created which all guaranteed railroads were required to accept at their face value. The Buenos Ayres & Pacific Railway Co. endeavored to make what was practically a test case of this law, but the answer of the government was that this law of congress annulled its obligations under the previously existing contract, which provided for seven per cent. interest on the invested capital. While it is doubtful whether this position will be sustained by the courts, this action should serve as a warning against undertaking future railroad enterprises in South America where the chief visible profits are to arise from this form of subsidy. It is noticeable that in many of the southern republics concessions no longer carry with them this guarantee, even the concession for the Brazilian line from Ponta Grossa to Corumbá omitting this now unpopular provision.

Plans and surveys for the narrow gauge railroad from Buenos Ayres to Rosario have been approved, and the contract for its construction has been submitted to the government for its approbation. The line will pass through San Martin, Pilar, Capilla del Señor, crossing a stretch of country between the Western and Rosario railroads. The main line will be 183 miles in length, with branch connections aggregating 22 miles.

Traffic returns from the Brazilian railroads show an increase over previous years, and at the present rate of gain many of the roads which are now a burden upon the state may soon become self supporting. As an example of the growing trade we append the receipts of three railroads:

Bahia & São Francisco, January to December, 1891, \$74,904; January to December, 1890, \$64,093. Great Western of Brazil, January to December, 1891, \$113,305; January to December, 1890, \$101,446. Recife & São Francisco, 15 weeks to December, 1891, \$117,378; 15 weeks to December, 1890, \$87,575.

The increase has been uniform even through the weeks of the recent political disturbances.

Rumor is current, both in England and in Brazil, that the house of Werden of New Orleans is organizing a steamship company to run a line of fine merchant vessels from Brazilian ports to New Orleans, Baltimore and Boston. Mr. Werden is reported as saying that "English commission houses, established in Brazil, buy extensively in the American market, selling these goods in Brazil at a profit of from 100 to 300 per cent. They are enabled to do this because they possess the means of communication and the facilities of adequate transportation."

Traffic with Rio de Janeiro and Santos, Brazil, is being seriously obstructed by a block of vessels in those ports, which are unable to discharge their cargoes owing to the inadequate facilities of docks and lighters. Two hundred vessels are now at anchor in the harbor of Santos, which will require 18 months to discharge at the present rate of progress.

Bolivia is experiencing a tremendous awakening in regard to transportation lines for her prospective commerce. The old Madeira & Mamore Railroad scheme is being revived in connection with a road from La Paz to the head of navigation on the Rio Beni, for which a concession has been granted. The Trans-Andean Railroad is being extended rapidly, having now reached Huari, within three days' journey by mule from the important city of Oruro, to which point it will be completed within nine months or less. Work is also in progress upon other lines, such as those projected from Sucre to Potosi, from Cochabamba to Santa Cruz, from Oruro to the Argentine, and from Tarifa to the interior. Many other lines have been projected, and it is now said that a route has been decided upon for the long-talked-of rail connection between La Paz and Puno.

The petroleum industry in Peru is rapidly increasing in importance, the shipments from Zorritos for last year having amounted to 2,324,219 kilos crude oil, 1,199,161 kilos petroleum and 1,115,067 kilos lubricating oil, which is an increase of 1,029,716 kilos over the shipments for the previous year. There were also large exports from the new works at Talara. Within a year 100 new coal mining claims have been registered in Peru, some of which will soon begin producing.

Colombia will celebrate its independence by a National Exposition at Bogota, to be opened on July 20, 1892. The exposition will remain open three months, after which the exhibits will be packed and shipped to Chicago for the World's Fair.

The Department of Public Works in Venezuela has decreed the construction of an iron bridge over the river Guaira, in order to place Caracas in communication with El Paraiso. The sum authorized to be expended upon this bridge is 120,000 bolivars, equal to \$21,000.

The Venezuelan Government has renewed the contract with Mr. Henry Rudloff, which was suspended five years ago, for the construction of a railroad from Puerto Cabello, via Taria and San Felipe, to Araure and Bruzual, and it seems probable that the line will now be built, thus opening up a large and fertile territory.

The Board of Trade Journal (English) announces that "Advices from Venezuela state that American exports to that country are now ahead of all others, their aggregate in the last fiscal year having been \$10,000,000. According to a correspondent this growth of a tendency toward American rather than British trade is due partly to the British Guiana boundary dispute and to the difficulties which have arisen with the Central Railroad of Venezuela and the La Guayra Harbor Improvement Co., both British enterprises, but chiefly to the current sympathy which is drawing the two republics closer together, and which arises not from the similarity of institutions, but from the facilities of communication and the popularity of American goods and methods of trade."

A town hall, constructed entirely of iron, is to be built by a Belgian firm for the municipality of Orizaba, Mexico. Apropos of this it may be mentioned that similar buildings are becoming popular in Venezuela and in other parts of South America, and might afford profitable business for American firms. A permanent exposition building, of iron throughout, is now being sent out from this country to Caracas.

Mr. Walter Merivale, Chief Engineer of the Costa Rica Pacific Railway, is about returning to Costa Rica to secure an extension of time for obtaining the necessary capital. The Costa Ricans are enthusiastic over the prospects of increased trade which this road will produce, and it is hoped that it will attract trans-Isthmian travel, as being healthier than the route via Panama.

A bed of coal, of excellent quality for steaming purposes, has been discovered on the shores of Shaguet Bay.

in the Straits of Magellan. The importance of the discovery to the commerce of the world is very great, considering that all steamers passing through the Straits are required to coal there, the supply for which has heretofore been brought from Cardiff, Wales.

The Lake Waterways Convention.

A body of 100 accredited and 48 honorary delegates assembled at Detroit on Dec. 17 "to consider questions relating to much-needed improvements in the channels of water communication through our great lakes, making 130 and 21 ft. the minimum depth throughout their entire length; the location of light-houses; the deepening of important harbors, and possibly the most feasible route for connecting these lakes with tidewater by a deep water channel that will float our largest vessels."

A pamphlet by W. A. Livingston gives the following average costs of carrying a bushel of corn from Chicago by lake to Buffalo during the years mentioned:

For	Cents per bushel.
1859.....	15.75
1861.....	10.50
1871.....	7.50
1881.....	3.20
1890.....	1.88

The steamer Maryland is taken as an example of the cheapening of rates which would follow deepening the channels. On 14 feet 3 inches draught she will carry about 2,875 net tons; with a 20-ft. channel, and 19-ft. draught she would carry about 4,550 net tons. A charge of \$1 per ton with the lesser draught is thus equivalent in net profit to the boat to a charge of \$0.63 per ton with the 19 ft. draught, assuming that the dispatch in port would be the same in both cases. The total cost of all river and harbor improvements on the Lakes to date is asserted to have been about \$20,000,000, and a saving for one year over like charges by railroad is figured out at \$147,027,514, on the assumption that the average freight rates for the season of 1890 were 1.2 cents.

The Convention resolved: 1st, That Congress be requested to authorize the speedy completion of a channel not less than 20 ft. in depth and of sufficient width between Chicago, Duluth and Buffalo, the Secretary of War to be authorized to make contracts for the entire work and a sufficient sum of money appropriated therefor.

2d, Considerations of prosperity in peace and security in war demand the construction of a waterway of sufficient capacity for vessels drawing 20 ft. through our own territory from the great lakes to the Atlantic Ocean, and Congress is requested to authorize the Secretary of War to cause surveys and estimates of cost of the various practicable routes to be made and appropriate a sufficient sum to defray the expenses. Deepening the Hudson to 20 ft. from Coxsackie to Troy, more liberal appropriations for light-houses, etc., were asked for, and the thanks of the Convention were unanimously voted to Gen. O. M. Poe for his long continued and faithful services to the people of the United States in the improvement of our waterways.

Smoke Nuisance in Chicago.

The Union League Club has taken the lead in the fight against the smoke nuisance in Chicago. It has called a meeting of all the clubs in the city for this week, and resolutions will be drawn up for the express purpose of compelling the city to take steps to clear the atmosphere.

The Pennsylvania Railroad's Marine.

Beside the harbor service at New York and Philadelphia the Pennsylvania Railroad also runs a steam towing service on its Delaware & Raritan Canal, and the combined services have led to the acquisition of some 236 vessels of all kinds, viz: Nine ferry boats, 31 tug boats, 3 steam lighters, 44 barges, 64 car floats, 28 canal boats, 42 fleet scows, 3 lighters, 10 schooners, 1 ice-breaker and 2 dredges. The nine ferryboats plying between Jersey City and New York during the year 1890 made 162,110 trips. They carried over 1,000,000 teams, and safely transported over 19,000,000 passengers, a number nearly equal to one-third of the entire population of the United States.

Fast Time Between Chicago and Kansas City.

A special train on the Chicago & Alton carrying the Howard Athenaeum company left Chicago at midnight Saturday night, Dec. 19, and arrived at Kansas City at 11 a. m. on Sunday, making the distance of 488 miles in 11 hours.

Roundhouse Burned.

The repair shops and roundhouse of the New York Susquehanna & Western Railroad at Wortendyke, near Paterson, N. J., were totally destroyed by fire this week. Four locomotives were badly damaged and a large number of tools were ruined.

The Exports of Wheat.

The largest movement recorded in any year for the last decade was in 1890, and in the following table the exports of wheat, including flour reckoned as wheat at the rate of 4½ bushels to the barrel, are shown for each month of the year 1891 in comparison with shipments for 1890 and 1886:

	1891.	1890.	1886.
January.....	9,155,588	7,997,374	6,873,923
February.....	7,791,615	9,376,763	7,883,061
March.....	10,569,207	10,077,654	7,925,466
April.....	10,872,949	9,911,515	8,679,732
May.....	10,240,119	8,884,635	11,576,881
June.....	10,422,700	6,857,142	12,747,122
July.....	13,695,890	7,892,532	11,017,532
August.....	26,277,682	9,428,115	16,102,123
September.....	25,797,089	5,418,085	14,462,379
October.....	19,610,046	7,571,092	11,470,981
November.....	20,101,980	7,157,940	12,640,253
December.....		9,613,653	12,319,913

Since the movement of the new crop began in July the shipments have been each month not only larger than in 1890, but larger than in 1886, or any other year of the last decade. In the four months, August, September, October and November, the exports were over 91,786,797 bushels, flour included, against 54,684,716 bushels in 1890. In December the exports have been maintained at nearly the same rate, although the complete official statement has not yet been published.—N. Y. Tribune.

LOCOMOTIVE BUILDING.

A new mogul engine is just ready to be turned out of the Michigan Central shops at St. Thomas, Ont. It has 19 x 24-in. cylinders, and driving wheels 68 in. in diameter. The boiler for this engine and a duplicate mogul, to be built at once, were made at Schenectady, but the other parts of the engine were all finished in the St. Thomas shops. Patterns for drivers have been made, and in future they can also be cast in the shops. This is the first engine of its size built in Ontario.

The following table gives a classified statement of the locomotives built by the Schenectady Works in 1891:

CYLINDERS.	8 whl.	10 whl.	12 whl.	Mo. gul.	Consolidation.	6 whl. switcher.	4 whl. switcher.	Forney.	Double flange.	Double flange urban.
11 x 21.....	1							1		
15 x 22.....	1									
18 x 20.....				2 n. g.						
17 x 21.....										
18 x 22.....	11							12	5	1
17 x 21.....	1									
18 x 24.....	11	62			7			45		
19 x 24.....	13	55						11		
19 x 20.....		22			19					
20 x 24.....					21					
20 x 26.....				4						
20 x 24.....										
20 x 24 compound.....	4									
20 x 26 compound.....	1									
20 x 26 compound.....			1							
Totals.....	36	144	7	26	21	68	6	1	5	
Grand total, 314.										

CAR BUILDING.

It is reported that the Hicks Stock Car Co., of Chicago, is about to place an order for 1,000 cars.

The Chicago & South Side Rapid Transit road has issued specifications for 75 cars for its elevated line, which the company expects to have completed in April.

The American Car Co., of St. Louis, manufacturers of street cars, have prepared specifications for twenty 60-ft. platform cars for use in transporting street cars.

The Litchfield (Ill.) Car Works have been given an order for twenty 60-ft. platform cars by the La Cede (street) Car Co., to be used in the shipment of street cars.

The Missouri Pacific has placed an order with the St. Charles Car Co. for 200 cars. Specifications are prepared for 1,500 more, and it is said the order will be placed soon.

Bids have been received by the Jacksonville South-eastern for 250 coal cars. The Gadsden, Ala., works are said to have been the lowest bidders, but the contract is not yet placed.

The Madison Car Works, Madison, Ill., have arranged to postpone the delivery of the 1,000 Chicago, Burlington & Quincy cars for which they have received the order, for 30 days.

In addition to the 1,000 cars which the Missouri Car & Foundry Co. is building for the Chicago, Burlington & Quincy, orders have also been received for 500 from the East Tennessee, Virginia & Georgia, and 500 from the Savannah, Florida & Western.

An order for 1,000 freight cars has been given the Litchfield Car & Machine Works by the Eureka Transportation Co., of Kansas City, Mo. These cars are to be leased to various roads on a mileage basis, and if the arrangements for leasing the first 1,000 prove successful a second order may be placed at once, probably for 4,000. The New York air brake will be used on the entire order.

BRIDGE BUILDING.

Anniston, Ala.—G. H. Crafts & Co., of Atlanta, Ga., have been awarded a contract for the construction of a bridge over the Chatte Creek, near Anniston, Ala.

Attala, Ala.—W. W. Converse, Attala, Ala., has been awarded a contract by the County Commissioners for the construction of a bridge over Willis Creek.

Burrard Inlet, B. C.—Application has been made to the Provincial Legislature for the incorporation of a company to build a swing bridge on Burrard Inlet, B. C., at some point west of the Capilano River, to a point opposite the south side of the inlet.

Byers, Colo.—The contract has been signed for the approaches where it is proposed to construct a \$2,500 bridge at Byers station. The County Commissioners will be asked this week to agree to the building of the bridge as proposed.

Elkton, Md.—The Philadelphia, Wilmington & Baltimore will, it is reported, construct a new bridge across Big Elk Creek.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Canada Southern, semi-annual, 1½ per cent., and special, ½ per cent., both payable Feb. 1.

Chicago, St. Paul, Minneapolis & Omaha, 3 per cent. on the preferred stock, payable Jan. 20.

Delaware, Lackawanna & Western, quarterly, 1½ per cent., payable Jan. 20.

Lake Shore & Michigan Southern, semi-annual, 2½ per cent., and special, 1 per cent., both payable Feb. 1.

Michigan Central, semi-annual, 2 per cent., and special, 1½ per cent., both payable Feb. 1.

New York Central & Hudson River, quarterly, 1 per cent., payable Jan. 15.

Panama, 3 per cent., payable Dec. 20.

Petersburg, annual, 3 per cent., payable Jan. 4.

Richmond, Fredericksburg & Potomac, semi-annual, 3½ per cent., payable Jan. 2.

Richmond & Petersburg, semi-annual, 3½ per cent., payable Jan. 4.

Rutland, 2 per cent. on the preferred stock, payable Dec. 31.

Toledo & Ohio Central, quarterly, 1½ per cent. on the preferred stock, payable Jan. 25.

Vermont Valley (of 1871), 3 per cent., payable Dec. 31.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Addison & Pennsylvania, annual, 49 Broadway, New York City, Jan. 11.

Albany & Pontego, annual, Norfolk, Va., Jan. 18.

Arkansas & Louisiana, annual, Washington, Ark., Jan. 25.

Bellair, Zanesville & Cincinnati, annual, Woodsfield, O., Jan. 4.

Boston & Lowell, annual, Boston, Mass., Jan. 6.

Brooklyn Elevated, annual, 31 Sands street, Brooklyn, N. Y., Jan. 6.

Cleveland & Pittsburgh, annual, Cleveland, O., Jan. 6.

Columbus, Hocking Valley & Toledo, annual, Columbus, O., Jan. 12.

Daguerahonda & Elk, annual, 505 Chestnut street, Philadelphia, Pa., Jan. 11.

Houston, Central Arkansas & Northern, annual, Dermott, Ark., Jan. 18.

Keokuk & Western, annual, Keokuk, Ia., Feb. 3.

Kings County (Elevated), annual, 346 Fulton street, Brooklyn, N. Y., Jan. 13.

Lehigh Valley, annual, 228 South Third street, Philadelphia, Pa., Jan. 19.

Little Schuylkill, annual, 410 Walnut street, Philadelphia, Pa., Jan. 13.

Mine Hill & Schuylkill Haven, annual, 119 South Fourth street, Philadelphia, Pa., Jan. 11.

Nesquehoning Valley, annual, 228 South Third street, Philadelphia, Pa., Jan. 11.

New York & Middle Coal Field, annual, 228 South Third street, Philadelphia, Pa., Jan. 12.

New York, Ontario & Western, annual, 18 Exchange Place, New York City, Jan. 10.

North Pennsylvania, annual, 240 South Third street, Philadelphia, Pa., Jan. 13.

Norwich & Worcester, annual, Worcester, Mass., Jan. 13.

Philadelphia & Reading, annual, 227 South Fourth street, Philadelphia, Pa., Jan. 11.

Philadelphia, Wilmington & Baltimore, annual, Wilmington, Del., Jan. 11.

Pittsburgh & Lake Erie, annual, 77 Fourth avenue, Pittsburgh, Pa., Jan. 26.

Pittsburgh, McKeesport & Youghiogheny, annual, Pittsburgh, Pa., Jan. 26.

St. Louis, Vandalia & Terre Haute, annual, Greenville, Ill., Jan. 12.

Terre Haute & Indianapolis, annual, Terre Haute, Ind., Jan. 4.

Terre Haute & Logansport, annual, Terre Haute, Ind., Jan. 4.

Toledo & Ohio Central Extension, annual, Marietta, O., Jan. 11.

Western & Atlantic, annual, Atlanta, Ga., Jan. 20.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The New York Railroad Club will hold its next meeting in the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, Jan. 15, commencing at 7:30 o'clock p. m.

The New England Railroad Club will hold regular meetings, commencing January, 1892, on the second Monday of each alternate month, at the United States Hotel, Beach street, Boston, Mass.

The Western Railway Club holds regular meetings on the third Tuesday in each month, except June, July and August, at the rooms of the Central Traffic Association in the Rookery Building, Chicago, at 2 p. m.

The Southern Railway Club holds regular meetings on the third Thursday of the months of January, February, March, May, September and November at such points as are selected at each meeting.

The Central Railway Club meets at the Hotel Iroquois, Buffalo, the fourth Wednesday of January, March, May, September and November.

The Northwest Railroad Club meets on the first Saturday of each month, except June, July and August, in the St. Paul Union Station, at 7:30 p. m.

The Northwestern Track and Bridge Association meets on the Friday following the second Wednesday of March, June, September and December, at 2:30 p. m. in the directors' room of the St. Paul Union Station.

The American Society of Civil Engineers holds its regular meetings on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street, New York.

The Boston Society of Civil Engineers holds its regular meetings at the American House, Boston, at 7:30 p. m., on the third Wednesday in each month.

The Western Society of Engineers holds its regular meetings at 78 La Salle street, Chicago, at 8 p. m., on the first Wednesday in each month.

The Engineers' Club of St. Louis holds regular meetings in the club's room, Laclede Building, corner Fourth and Olive streets, St. Louis, on the first and third Wednesday in each month.

The Engineers' Club of Philadelphia holds regular meetings at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturday of each month. The annual meeting is held on the third Saturday in January. The club stands adjourned during the months of July, August and September.

The Engineers' Society of Western Pennsylvania holds regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Thaw Mansion, Fifth street, Pittsburgh, Pa.

The Engineers' Club of Cincinnati holds its regular meetings at 8 p. m. on the third Thursday of each month in the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati.

The Civil Engineers' Club of Cleveland holds regular meetings on the second Tuesday of each month, at 8 p. m., in the Case Library Building, Cleveland. Semi-monthly meetings are held on the fourth Tuesday of the month.

The Engineers' Club of Kansas City meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The Engineering Association of the South holds its monthly meetings on the second Thursday at 8 p. m. The Association headquarters are at Nos. 63 and 64 Baxter Court, Nashville, Tenn.

The Denver Society of Civil Engineers and Architects holds regular meetings at 33 Jacobson Block, Denver, Col., on the second and fourth Tuesday of each month, at 8 o'clock p. m., except during June, July and August, when they are held on the second Tuesday only.

The Civil Engineers' Society of St. Paul meets at St. Paul, Minn., on the first Monday in each month.

The Montana Society of Civil Engineers meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The Civil Engineers' Association of Kansas holds regular meetings at Wichita on the second Wednesday of each month at 7:30 p. m.

The American Society of Swedish Engineers holds meetings at the club house, 250 Union street, Brooklyn, N. Y., and at 347 North Ninth street, Philadelphia, on the first Saturday of each month.

The Engineers' Club of Minneapolis meets the first Thursday of each month in the Public Library Building, Minneapolis, Minn.

The Canadian Society of Civil Engineers holds regular meetings at its rooms, 112 Mansfield street, Mon-

treas. P. Que., every alternate Thursday except during the months of June, July, August and September.

The Association of Civil Engineers of Dallas meets at 803 Commerce street, Dallas, Tex., on the first Friday of each month at 4 o'clock p. m.

The Technical Society of the Pacific Coast holds regular meetings at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., at 8 o'clock p. m. on the first Friday of each month.

Western Railway Club.

President Peck has appointed the following committee on resolutions to report at the next meeting of the Club: C. A. Schroyer, Superintendent Car Department Chicago & Northwestern; G. W. Rhodes, Superintendent Motive Power Chicago, Burlington & Quincy; G. M. Sargent, Congdon Brake Shoe Co., Chicago, and W. H. Marshall, Secretary. The next meeting of the Club will be held on Tuesday, Jan. 13, at 2 o'clock p. m., in the club rooms, 850-854 Rookery Building, Chicago, at which meeting Mr. Peck's paper on "M. C. B. Standards and Defect Cards" (read at the November meeting) will be discussed, and Mr. D. L. Barnes will read a paper on "Recent Improvements in American Railroad Rolling Stock."

PERSONAL.

—Mr. Thomas Groome, Supervisor of the Delaware, Maryland & Virginia Railroad, died at Lewes, Del., Dec. 28, aged 65 years. He was Superintendent of the road before it passed into the control of the Pennsylvania.

—Mr. E. Marshall, formerly Superintendent of Motive Power of the St. Louis, Arkansas & Texas, has been appointed Superintendent of Machinery of the Madison Car Co., Madison, Ill. The engagement begins Jan. 1.

—Mr. E. C. Bradley, Superintendent of Telegraph of the Pennsylvania lines west of Pittsburgh, has resigned his position with that company, to take effect Jan. 1. Mr. Bradley will accept the position of General Manager of the Postal Telegraph Co.

—Mr. Edward W. Kinsley, one of the Massachusetts State Railroad Commissioners, died at his home in Boston, Dec. 26, at the age of 62. He was born in Nashua, N. H., but when he was two years old his parents moved to Springfield, Mass., and he was educated in the public schools of that city. He became a merchant in Boston and during the war was prominent among Massachusetts defenders of the Union. Governor Andrew intrusted him with many important missions to Washington and to the front. He was a State Director of the New York & New England Railroad in 1873 and was appointed Railroad Commissioner by Governor Rice in 1878. He resigned in 1883 to go into other business, but was again appointed in 1884 and held the office up to the time of his death.

—Mr. Samuel B. Reed, Mem. Am. Soc. C. E., who died at Pasadena, Cal., Dec. 26, where he had gone for his health, was one of the best known railroad engineers in the West. He was employed on various roads leading into Chicago from the East, and continued his service on roads between Chicago and the Missouri River until the Union Pacific was fairly organized; when having completed the Washington branch of the Chicago, Burlington & Quincy he went into the service of the Union Pacific, a road he always intended to help build. He first had charge of preliminary explorations west of Green River, in which service he not only picked out the route that was substantially followed, but convinced Brigham Young, the Mormon prophet, who up to that time had been bitterly opposed to the railroad, that it would be to his advantage to help the enterprise. On his return from this duty he was made Engineer and General Superintendent of Construction, an office he held from about the time the road crossed the Loup Fork until its completion. From the North Platte and Green River the country was full of hostile Sioux continually attacking engineering and grading parties, but Mr. Reed rode unescorted along his line, trusting to the speed of his horse, though once or twice he exchanged shots with the hostiles. It was on this road that he built within one year and 30 days 535 miles of railroad; much of it, of course, was very light work, but there were four tunnels and some heavy rock work. One of the tunnels, No. 2, which required mining, however, was not completed till some time after the expiration of the year and 30 days. When the Union Pacific was completed Mr. Reed thought he had had responsible charge of the construction of more miles of railroad than any other man contemporary with him, and he had certainly built more during a given time. Since 1870 Mr. Reed has resided at Joliet, Ill., and excepting his revision of the location of the Canadian Pacific and his connection with the construction of that road he has done, we believe, very little technical work. Mr. Reed had remarkable skill as a locating engineer, not only seeing the capacity of the country before him but having a good judgment of the lay of the land around him which he had not seen. Mr. Reed was 73 when he died.

ELECTIONS AND APPOINTMENTS.

Atchison, Topeka & Santa Fe.—The office of assistant passenger traffic manager having been established, John J. Byrne, Assistant General Passenger and Ticket Agent, has been promoted to that office, with headquarters at Chicago.

Atlantic & Danville.—A. P. Thorn is now sole Receiver of the road, Charles H. Cromwell, joint-receiver, having resigned.

Augusta, Aiken & Sumter.—The company has been chartered in South Carolina by G. W. Croft, F. B. Henderson, J. G. Haynham, M. B. Woodward and John G. Evans, of Aiken, S. C.

Chicago & Grand Trunk.—David Brown, Assistant General Freight Agent, has been appointed General Freight Agent of the Chicago & Grand Trunk and Cincinnati, Saginaw & Mackinaw. He has been acting as General Freight Agent of these lines for some time past.

Chicago, Keokuk & Southwestern.—The incorporators are: William Logan, W. K. Johnson, James W. Summers, J. H. Anderson, Keokuk, Ia.; H. K. Dickinson, M. Leroy, Hamilton, Ia.; George Edmunds, Carthage, Ill.; Thomas Homer, Vermont, Ill.

Cincinnati, Hamilton & Dayton.—J. A. Orbison has been appointed Superintendent of Telegraph, with headquarters at Cincinnati.

Cleveland, Cincinnati, Chicago & St. Louis.—Albert S. White, Assistant General Freight Agent at Cincinnati, O., has been appointed General Freight Agent.

He will be succeeded by R. P. Buchanan, General Agent for the Freight Department in Cincinnati.

Gaffney City.—The following incorporators have applied for a charter in South Carolina: J. B. Bomar, J. A. Carroll, A. N. Wood and John B. Cleveland.

Grand Trunk.—David Morice, Agent at Niagara Falls for the past six years, has been appointed Assistant Superintendent of the Southern Division of the road, with headquarters at London, Ont., succeeding R. Lamour, who has retired.

Illinois Central.—A. J. Whitworth has been appointed Chief Train Dispatcher, with jurisdiction from Canton to New Orleans, and with office at McComb City, Miss.

Johnsonburg & Bradford.—J. M. Floesch has established his headquarters at Bradford, Pa., as Resident Engineer and Superintendent of Construction.

Kentucky Midland.—E. French Hoge has been appointed General Freight and Passenger Agent of the road, with headquarters at Frankfort, Ky., vice Vernon L. Clark, resigned. Charles D. Bercaw has been appointed Auditor, with headquarters at the same place.

Lake Shore & Michigan Southern.—F. E. House has been appointed Principal Assistant Engineer between Buffalo and Toledo. His headquarters will be at Dunkirk, N. Y.

Missouri Pacific.—For convenience of operation, the Kansas, Nebraska and Dakota Division of the Kansas & Colorado Pacific (Fort Scott, Kan., to Topeka, Kan., now in charge of H. G. Clark, Superintendent, will be included in the jurisdiction of S. T. Shankland, Superintendent. That portion of the Denver Memphis & Atlantic division of the Kansas & Colorado Pacific, between Chetopa, Kan., and Coffeyville, Kan., now in charge of R. Harding, Superintendent, will, after Jan. 1, be included in the jurisdiction of H. G. Clark, Superintendent.

W. A. Stith has been appointed General Freight Agent, the appointment to take effect Jan. 1. Mr. Stith is now General Freight Agent of the Kansas City, Fort Scott & Memphis, and was formerly Assistant General Freight Agent of the Missouri Pacific.

Pennsylvania.—Joseph D. Greene has been appointed Auditor of Disbursements in the Accounting Department to fill the vacancy caused by the death of Thomas R. Davis.

Rome, Watertown & Ogdensburg.—The annual meeting of the stockholders was held in New York, Dec. 28. Two of the directors, John H. Krause and Cyrus J. Lawrence, retired from the board, and Chauncey M. Depew and H. Walter Webb were elected in their stead. The other directors are William M. White, Charles Parsons, Clarence S. Day, Charles Parsons, Jr., Edwin Parsons, William Lummis, Walton Ferguson, J. G. A. Johnson, George Parsons, John Thorne and J. F. Maynard. The old officers of the road were re-elected as follows: Charles Parsons, President; Clarence S. Day, First Vice-President; Charles Parsons, Jr., Second Vice-President; J. A. Lawrence, Secretary and Treasurer.

Union Pacific, Denver & Gulf.—J. W. Titley has been appointed Supervisor of Bridges and Buildings on the Fort Worth & Denver City road, vice J. P. Parker, resigned.

Utica & Black River.—The stockholders re-elected the Board of Directors at the annual meeting, Dec. 28. The directors chose Charles Parsons, President; Clarence S. Day, First Vice-President; Charles Parsons, Jr., Vice-President, and J. A. Sawyer, Secretary and Treasurer.

RAILROAD CONSTRUCTION.

Incorporations, Surveys, Etc.

Alabama Grand Trunk.—J. A. Adams, of Montgomery, Ala., has been awarded the contract for building the first 10 miles from Montgomery toward the Tallapoosa River. Five miles of this will be used as a belt line before other parts of the road have been completed. This section, as already stated, is to be built out of state funds of Alabama which have been appropriated to the railroad. The location has been made across the Tallapoosa River to Equality, 30 miles, and the preliminary survey has been made to a connection with the Chattanooga Southern, a distance of 135 miles. The railroad will be built for a considerable distance over an old highway and the balance will be in the valleys of the mountains, which trend southwest. The bridge at the Tallapoosa River is 400 ft. long, with trestle approaches of 2,520 ft.

Aitona Short Line.—A charter was issued last week for this railroad, beginning at Everett, Bedford County, with branches to Laughdon and Riddleburg, and connecting with the Pennsylvania railroad at Ore Hill, Pa. The road will be 40 miles long. The capital stock is \$350,000, which has been subscribed mostly by residents of Philadelphia.

Augusta, Aiken & Sumter.—The Virginia legislature has granted the charter of this company. It is understood to be an extension of the Atlantic Coast line. The new road is to extend from Augusta by way of Aiken to Sumter, where it will connect with the main line of the Coast line from Wilmington. Contracts are to be let as soon as the organization has been completed. John C. Evans, of Aiken, S. C., and others, are incorporators.

Aus in & Northwestern.—Col. B. M. Temple, who is the engineer in charge of location on the Llano extension, is still in the field locating an extension from Fairland, a station six miles from Marble Falls, the northern terminus, west to Llano, and has already nine miles of the location made. The remainder of the survey will be finished as soon as possible, and in a short time the contract for the grading will be let. From Fairland to Llano is about 30 miles. The road is now controlled by the Houston & Texas Central, of which G. A. Quinlan, of Houston, is general superintendent and chief engineer.

Beech Creek.—George S. Good & Co., who have large contracts on the extension of the road through Cambria County, Pa., have received orders to build all the tunnels on the line wide enough for a double track, which will increase the cost of the work at least \$100,000.

Brookline & Pepperell.—Tracklaying has been recently commenced near West Groton, Mass., and rails are now being laid north of that town toward the New Hampshire State line. The road from West Groton via Pepperell, Mass., to Brookline, N. H., 15 miles, is under contract to Frank Meade & Co., of Boston.

Buffalo & Gen. va.—Practically less than a half a mile of track remains to be laid near the Genesee

River to complete this road, the Buffalo extension of the Lehigh Valley. This will be laid within the next 10 days, although the line will hardly be opened for regular business before May 1, when the trackage rights over the Erie will expire. Ballasting has been done all along the line, and a good deal of the second track has been laid. This can be done very rapidly now, as the heavy work for the two tracks is all completed.

Cambridge, Minneapolis & Duluth.—This company was incorporated in Minnesota last week with a capital stock of \$500,000, with H. F. Barker, President; D. O. Anderson, Vice-President; C. W. Van Winner, Secretary; O. O. Hallin, Treasurer. The company has been organized at Cambridge, Minn.

Catawba Falls.—This company, which has applied to the South Carolina legislature for a charter, proposes to build a railroad from a point on the Georgia, Carolina & Northern, between Fishing Creek and Chester, to Catawba Falls. F. H. Barber, S. J. Lewis, P. L. Hardin, W. A. Drennan and others are incorporators. The capital stock is \$200,000.

Chesapeake & Ohio.—Work has been begun on the second tracking from Low Moor to Covington, Va., 8.5 miles, and from Alderson to Lowell, W. Va., 9.5 miles. In addition it is proposed to build two stretches of double track on either slope of the Alleghany Mountains, all of which will aggregate 40 miles of second track in the Greenbrier district, which is 80 miles in length. It is expected to have all this second track in operation in 1892. The contracts for the double tracking from Low Moor to Covington have been awarded as follows: Low Moor to Steele's, two miles, to Montague & Tyler; four miles west from Steele's, Dickson & Co., of Clifton Forge, Va., and four miles east from Covington, Rhinehart & Co., of Covington.

Chicago, Keokuk & Southwestern.—The company has been organized at Keokuk, Ia., and proposes to build a road from Havard, Ill., to Keokuk, and west of that town, passing through the counties of Hancock, Macomb and Fulton in Illinois. William Logan, of Keokuk, is the President of the company.

Columbia River & Astoria.—Colonel Griggs and F. D. Heustis, railroad contractors of Tacoma, Wash., have offered to build a railroad from Goble to Astoria, a distance of about 58 miles, for a bonus of \$300,000, of which \$400,000 must be in cash and the remainder may be in lands.

Denver & El Paso Short Line.—The surveying party under Horace Ropes has returned to Las Vegas from White Oaks, N. Mex., having finished the preliminary survey of the line between the two towns. The northern party, under H. P. McCrickett, is snow-bound in the mountains of the Maxwell grant.

Duluth, Mesabi & Northern.—The contract for building this road was formally let Dec. 21 in St. Paul, to Donald Grant & Co. of Faribault and Foley Bros. & Guthrie of St. Paul, who have also built the Duluth & Winnipeg. The line will be 48 miles long, with a 12 mile branch at the northern end. Contracts for one dock at Duluth have not yet been let, but it is believed they will go to the same firm. There are no rock cuts on the line, which is to extend through a timbered section in Northern Minnesota, north of the St. Louis River, and there are only three truss bridges. The right of way has been already cleared for a considerable portion of the distance.

Hampton & Branchville.—Samuel Dibble, W. H. Mauldin, J. A. Lightsey and others are the incorporators of the Hampton & Branchville Railroad & Lumber Co., which has applied to the South Carolina legislature for a charter to build a railroad from a point on the Savannah River below Hamburg via Hampton to Orangeburg and to Sumter. The capital stock is \$50,000.

Hearne & Brazos Valley.—The work has been suspended recently on this road leaving uncompleted the tracklaying to the proposed terminus on the Brazos River, near Mumfords, Tex. The road has been graded for about nine miles southwest of Hearne, through the Brazos Valley, largely by the farmers along the route.

Houston, Central Arkansas & Northern.—The balance of the track completing the southern extension from Columbia, La., was laid at Alexandria last week. The road is now completed from its connection with the St. Louis, Iron Mountain & Southern, near McGehee, Ark. The road has been in operation south to Columbia most of this year. South of that point 70 miles of track has been laid in 1891. The bridge over the Red River, at Alexandria, is not quite finished, and there is some ballasting to be done.

Kansas City, Fort Smith & Southern.—Chief Engineer Patterson has begun a survey from Sulphur Springs, Ark., south via Siloam Springs, Ark., and also via Bentonville, Ark., to Fort Smith. The road is now in operation from Joplin, Mo., and Sulphur Springs, Ark.

Kansas City, Southwest City & Southern.—The company was chartered in Missouri last week to construct a road from Joplin in a southerly direction through the counties of Jasper, Newton and McDonald to Southwest City. The length of the road will be 40 miles, and the capital stock is \$400,000. The directors are J. C. Seaborn, M. A. Settlick, G. K. Smith, W. D. Polson, D. W. Gafagan, J. Strumbers, W. F. Smith.

Louisiana & Northwest.—The company will, it is stated, issue \$450,000 of bonds to complete its road from Homer to Alexandria, Ga., and build north from Bienville.

New Boston.—The survey has just been completed from Parkers' Station, west of Manchester, N. H., on the Manchester & North Weare branch of the Concord & Montreal, south about five miles to New Boston, N. H., near Goffstown.

Newport.—The Newport Railroad, Hotel, Land & Improvement Co. has applied to the Virginia legislature for a charter, with Manning C. Staples, William Marshall, John C. Robertson and others as incorporators. The company is authorized to build a railroad from West Point through the counties of King William, King and Queen, Gloucester and Mathews to a point on the Chesapeake Bay.

New York, Susquehanna & Western.—The company completed the last section of the second track between Paterson and Jersey City Dec. 22, and trains are now running regularly.

Northern Pacific.—The company is ballasting the 20 miles of track laid on the South Bend line beyond Chehalis, as far as Pe-Eli prairie, and is making some

rock cuts in the mountains, as that work can be done in any weather, but no other new work is being done on that line this winter. On the Gray's Harbor line, west of Centralia, track has been laid as far as Ocosta, Wash., and the bridge across the Chehalis River at Aberdeen will be finished about Jan. 5. But the line to Ocosta will not be ballasted until dry weather sets in.

Odesa & Middleton.—An injunction has been issued ordering a stay in the prosecution of the work on this road near Odesa, Del. It was granted at the instance of the land owners along the route, who were joined in the petition by the Road Commissioners, who were interested to prevent the company building along the highway as proposed.

Old Colony.—The contract work on the Walpole & Dedham branch, between Walpole Junction and Norwood Central, Mass., is all finished, and the track is laid and ballasted ready for use, with the exception of half a mile at Norwood, which is not up to grade, but which is being finished as fast as possible at the rate of a thousand yards or more a day. The last mile of the road at Norwood crosses the Neponset River Valley on an embankment three-fourths of a mile long and from 20 to 40 ft. high, crossing Neponset River and two highways. There are 225,000 yards of earth in this embankment and some 4,000 yards of masonry in the arches over the river and one highway, and 600 yards at the other highway. The grading will probably be completed by March. Otherwise the road is completed and ready for operation.

Pennsylvania.—The work of double tracking the Mount Joy branch from Dillerville to Middletown, Pa., will shortly begin. The company will award the contracts in a few days. The engineers have finished their work on several sections, and these are ready for the contractors. Contractors have been invited to prepare bids on the sections between Dillerville and Landisville, a distance of 5½ miles, and between Hillsdale and branch intersection, a distance of 2½ miles.

Philadelphia Belt Line.—A decision was rendered in the Common Pleas Court at Philadelphia this week making permanent the temporary injunction recently granted restraining the Belt Line from laying its tracks along Delaware avenue. The territory covered by the injunction extends from South street to Callowhill street, and deprives the Belt Line Company of its most important territory. The case will be appealed to the Supreme Court.

Plymouth & Middleboro.—The contract for grading the road from Plymouth to Middleboro, Mass., has been awarded to McCarty Bros., Franklin, Mass.

Richmond & Southwestern.—The company has applied to the legislature for a charter, with H. W. Anderson, W. W. Anderson, W. S. Gooch, Clarence Coleman and others as incorporators. The road is to commence near Manchester and extend through Chesterfield and Dinwiddie counties to a point near Sutherland's, on the Norfolk & Western Railroad. The authorized capital stock is \$1,000,000.

Roanoke, Salem & Western.—A bill has been introduced in the legislature chartering this company, with John W. F. Allemon, James E. Langhorne, D. B. Strouse, J. T. Engleby, of Salem; James S. Simmons, of Roanoke, and others as incorporators. The company is to build a road from the Richmond & Alleghany Railroad, in the County of Botetourt, or from Roanoke, extending through Roanoke and Salem to Craig or Montgomery County, thence toward the Kentucky State line.

Roanoke & Southern.—President S. H. Fries, of the North Carolina Construction Co., says that the entire line from Roanoke, Va., to Winston, N. C., will be opened for traffic Jan. 15. The road opens up a new territory rich in agriculture, mineral and manufactured products. A traffic arrangement has been entered into with the Norfolk & Western whereby the Roanoke & Southern will secure a northern outlet for its business.

St. Louis & Birmingham.—The preliminary survey south of the Tennessee River has been completed from Clifton, Tenn., to Sheffield, Ala. The line, as located, passes four miles east of Florence and crosses the Tennessee River at the head of Seven Mile Island. The surveying party was in charge of Captain Proctor of Sheffield.

Savannah, Americus & Montgomery.—Trains on the Montgomery extension from Louvale are now run to Hartsboro, Ala., and they will probably go through to Montgomery early in January.

Savannah & Gulf.—The Suwannee River Phosphate Co. has chartered this railroad, to extend from the Suwannee River through Suwannee, Alachua and Levy counties to Bronson or Archer, Fla. Charles P. Turner, of East Alabama street, Atlanta, Ga., is Superintendent.

Sumter, Lake City & Conway.—M. H. Fields, H. W. Mackey, C. A. Ravenel, Richard Brown and others are the incorporators, of this South Carolina Company, which is projected to extend from Sumter via Bethlehem and Lake City to Conway.

Sumter & Wateree.—Surveys have been made for building the road from Sumter to Camden, S. C., a distance of 30 miles. The route is quite level. I. D. Blanding, of Sumter, is President.

West Virginia, Central & Pittsburgh.—A Baltimore dispatch states that engineers of the company are revising the preliminary surveys for the proposed extension of the road from Cumberland, W. Va., east to Baltimore, made in the spring of this year. The route by High Knob has a 600 ft. tunnel and another of 2,300 ft. through the South Mountain. The present route of the Baltimore & Ohio from Frederick to Baltimore is 60 miles long, while the more direct line over the mountain proposed by the West Virginia Central will be probably 15 miles.

GENERAL RAILROAD NEWS.

Central of New Jersey.—Below will be found the earnings of the road for November, 1891, and the 11 months, Jan. 1 to Nov. 30, compared with the same months of last year:

Month of November:	1891.	1890.	Inc. or Dec.
Gross earnings.....	\$1,221,479	\$1,234,222	D. 89,821
Operating expenses.....	702,125	646,351	I. 52,774
Net earnings.....	\$519,354	\$587,911	D. 68,596
Jan. 1 to Nov. 30:			
Gross earnings.....	\$13,046,359	\$12,486,829	I. 559,529
Operating expenses.....	7,462,114	7,081,675	I. 380,438
Net earnings.....	\$5,584,244	\$5,405,153	I. 179,090

Flint & Pere Marquette.—The Supreme Court of Michigan has confirmed the railroad company's title to 10,000 acres of land, valued at over \$1,000,000 and contested by the state of Michigan. The state claimed the lands by virtue of the swamp land grant, while the railroad claimed the title thereto according to an act granting lands in aid of construction of railroads.

Missouri Pacific.—In the district court at Lincoln, Neb., this week an award was made to John Fitzgerald for \$475,000 in his suit against the Fitzgerald-Mallory Construction Co. and the Railroad. The Construction Company, in 1887, took the contract for building the Denver, Memphis & Atlantic from Chetopa, Kan., to the Colorado line, about 150 miles. The contract price was \$100,000 a mile, to be paid in first mortgage bonds. While the line was being constructed it was purchased by the Missouri Pacific, and Jay Gould, Russell Sage and Sidney Dillon secured an interest in the construction company by advancements of money. When the road was completed, it is asserted, they refused to transfer the bonds.

New York, Lake Erie & Western.—The following table shows the operations of the road for November, 1891, and the two months, Oct. 1 to Nov. 30, compared with the corresponding periods of 1890:

Month of November:	1891.	1890.	Increase.
Gross earnings.....	\$2,662,891	\$2,514,425	\$148,466
Operating expenses.....	1,801,476	1,673,811	127,665
Less proportions due leased lines.....	\$861,405	\$840,614	\$20,790
Net earnings.....	\$637,164	\$601,679	\$35,484
Oct. 1 to Nov. 31:			
Gross earnings.....	\$5,558,170	\$5,227,163	\$331,007
Operating expenses.....	3,649,215	3,368,203	281,012
Less proportions due leased lines.....	\$1,908,995	\$1,858,960	\$49,935
Net earnings.....	\$1,434,729	\$1,389,011	\$45,718

Oregon & Washington Territory.—W. D. Tyler has been appointed Receiver of the railroad in Washington and Oregon, on the petition of the Farmers' Loan & Trust Co., of New York. The lines were built in 1889 and 1890 by George W. Hunt, a railroad contractor of Washington. They were purchased in the early part of this year by Charles B. Wright, of Philadelphia.

Pacific Railroads.—The Secretary of the Treasury gives notice that there are remaining in the sinking funds of the Union and Central Pacific railroad companies the following 6 per cent. bonds: \$45,000 maturing Feb. 1, 1896; \$207,000 maturing Jan. 1, 1897; \$1,044,000 maturing Jan. 1, 1898; \$601,000 maturing Jan. 1, 1899. He will accept hereafter, in exchange for the two first mentioned amounts, \$252,000 of first mortgage Pacific Railroad bonds, maturing Jan. 1, 1897. With this exception the receipt of first mortgage bonds in exchange for currency notes will be limited to those maturing after Jan. 1, 1898.

Pennsylvania.—The following is the statement of the business of all lines for November: All lines east of Pittsburgh and Erie show an increase in gross earnings of \$34,558, an increase in expenses of \$210,619, a decrease in net earnings of \$175,761. All lines west of Pittsburgh and Erie for November, 1891, as compared with the same month in the previous year, show an increase in gross earnings of \$181,124, a decrease in expenses of \$33,438, an increase in net earnings of \$219,562.

Richmond & West Point Terminal.—The committee that Frederic P. Olcott, President of the Central Trust Co., had been authorized to appoint to represent the common stockholders was nominated this week. Beside Mr. Olcott it consists of Colonel Oliver H. Payne, F. D. Tappen, President of the Gallatin National Bank; W. H. Perkins, President of the Bank of America, and Henry Budge, of Hallgarten & Co.

South Carolina.—The agreement for the reorganization of the company dated July 2, 1890, has been abandoned. Another reorganization committee has been formed, including F. P. Olcott, Gustav J. Wetzel, F. S. Smithers, Otto Lowengard, and Henry P. Tadmage. Holders of purchase money consolidated second mortgage bonds or purchase money income bonds, or shares of the capital stock, are invited to deposit their securities with the Central Trust Co., on or before Jan. 25. The report of the Receiver for the year ending Oct. 31 shows gross earnings of \$1,171,150, an increase of \$225,072. The net earnings were \$502,273, nearly 12 per cent. greater than those of last year. The increase in tonnage is 27 per cent. and the increase of passengers carried is 20 per cent.

Western Maryland.—The gross earnings of the Western Maryland Railroad and its branches during the last fiscal year were \$904,378; net earnings, \$333,209; expenditures in betterments, \$81,770. The President, in his report, speaks of the large increase in revenue during the last four months, resulting from the recently established connection through the Cumberland Valley between the Baltimore & Ohio and Philadelphia & Reading systems by bridging the Susquehanna River, and establishing a new route between Harrisburg and Hagerstown for anthracite and bituminous coal, rails and other heavy freight. Appreciating that the long circuit from Hagerstown, via Waverly, Harper's Ferry and Martinsburg to Cherry Run would prove a serious drawback to this line, arrangements were made to build the Potomac Valley road from Williamsport, on the Potomac River, to Cherry Run, W. Va., 14 miles, and this line is now nearing completion; as a result a saving of 41 miles in the through line will be effected. The Potomac Valley will start operations with almost as much business as it can readily handle.

Williams Valley.—A second mortgage for \$20,000 given by the railroad company to the Guarantee Trust & Safe Deposit Co., of Philadelphia, was placed on record at Pottsville, Pa., this week.

TRAFFIC.

Traffic Notes.

The first class passenger rate between Columbus, O., and Chicago has been reduced from \$8.35 to \$7.

The merchants of Tacoma, Wash., are taking steps toward the organization of a transportation bureau.

A Minneapolis press dispatch states that scarcity of freight cars is beginning to seriously hamper the flour mills at that city.

The California Traffic Association has issued an ad-

dress to the citizens of the Pacific Coast urging support of the Nicaragua Canal.

The New York, Ontario & Western and the Grand Trunk have joined the New York, Lake Erie & Western and the Delaware & Hudson in restoring passenger traffic relations with the Chicago & Alton.

A shipment of carpet from New York City to San Francisco last week consisted of 1,945 packages, making about 12 carloads. It went by steamer to New Orleans and thence by the Southern Pacific.

A Montreal dispatch states that the Grand Trunk will at once resume the running of second class sleeping cars, having evidence that two of the other trunk lines have already violated the agreement under which these cars were to be discontinued after Nov. 30.

On the application of the Chicago, St. Paul, Minneapolis & Omaha, Chairman Finley, of the Western Passenger Association, has issued a ruling authorizing all roads to allow second class passengers to California points first class accommodations to the Missouri River.

The New York Board of Trade and Transportation will enter a suit in the United States courts to enforce compliance by the trunk line railroads with the order of the Interstate Commerce Commission which directed that freight rates from the Atlantic seaboard westward must be the same on shipments originating at New York as by those coming from European ports on through bills of lading.

A Chicago dispatch states that the charges published a few weeks ago insinuating that the passenger department of the Chicago, Burlington & Quincy had paid commissions to local ticket agents of the Lake Shore & Michigan Southern, contrary to an agreement between the roads, and then had reported to the latter road the names of the recipients, have been retracted by the paper that made them.

Philadelphia papers state that the export grain business from that city is growing rapidly. For the first time in several years six British steamships are loading grain at that port. The Philadelphia & Reading is interested in a new line of steamers, the North Atlantic & Trident Line, and some of the ships of the North Atlantic Transport Co., running in connection with the Pennsylvania road, now load at Philadelphia instead of Baltimore.

The Railroad Commissioners of Georgia, on application of the road, have authorized the Georgia Southern & Florida to raise local passenger rates to three cents a mile, which rate was abolished several months ago to permit the adoption of a "zone system," under which the rates per mile for long distances were very low. These long distance rates were the principal ones in which the company had competition from the older roads, and the latter, it will be remembered, at once refused to participate in through ticketing arrangements.

Abolition of Unlimited Tickets on the Chicago & Alton.

The Chicago & Alton has issued the following notice: On and from Jan. 1, 1892, and until further notice, no stop-over will be allowed on this line on any class of ticket. All single-trip tickets will be limited to expire one day after date of sale, and will be accepted on regular passenger trains only for continuous train passage, if presented on or previous to date of expiration.

Round-trip tickets will be limited to expire for going passage on the day after date of sale, and returning coupons will be limited to expire 10 days after date of sale. Both going and returning coupons of round-trip tickets will be good for continuous train passage on any regular passenger train if presented on or previous to date of their expiration.

The Interstate Commerce Commission

The Commission has announced its decision of the case of the Hazel Milling Co., of East St. Louis, against the St. Louis, Alton & Terre Haute and the Illinois Central. The milling company has a private siding in East St. Louis and appears to have demanded equality with St. Louis shippers. The rates eastward from St. Louis seem to be the same as from East St. Louis and the former includes bridge or ferry toll. If a St. Louis shipper carts his freight to East St. Louis a rebate is allowed him and the complainant in this case asked that he be allowed a rebate when he carted from his place. The syllabus of the Commission's opinion says: It is held that, on flour which the initial carrier requests petitioner to haul to its station or which petitioner is compelled to haul there, by reason of proper cars not being furnished on sidetracks, petitioner is entitled to a reduction of six cents a barrel on rates in force as long as defendants bear that amount of the cost of cartage for other shippers. The rule requiring petitioner to clean and repair cars furnished on the sidetrack is unreasonable; but the requirement that it shall load such cars in the order of destination is not unreasonable, and rates on flour loaded by petitioner in properly cleaned and repaired cars so furnished are, upon the facts, properly the same as rates in force on flour originating in St. Louis. Questions arising under a practice of partial or absolute free carriage, or growing out of the existence of sidetracks to shippers' doors, must depend largely for solution on the particular circumstances of each case.

Eastbound Shipments.

The shipments of eastbound freight, not including live stock, from Chicago by all the lines for the week ending Dec. 19 amounted to 120,361 tons, against 98,949 tons during the preceding week, an increase of 21,412 tons, and against 80,797 tons during the corresponding week of 1890, an increase of 39,564 tons. The proportions carried by each road were:

	Wk. to Dec. 19		Wk. to Dec. 12.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central.....	17,697	14.7	13,571	13.7
Wabash.....	5,756	4.8	5,750	5.8
Lake Shore & Michigan South.	19,431	16.2	13,375	13.5
Pitts., Ft. Wayne & Chicago.....	21,117	17.6	12,964	13.1
Pitts., Cin., Chicago & St. L.....	11,355	9.3	8,699	8.8
Baltimore & Ohio.....	7,283	6.0	6,231	6.3
Chicago & Grand Trunk.....	13,915	11.6	13,742	13.9
New York, Chic. & St. Louis.....	11,122	9.1	10,336	10.5
Chicago & Erie.....	12,125	10.1	12,290	12.4
Total.....	120,361	100.0	98,949	100.0

Of the above shipments 9,603 tons were flour, 68,842 tons grain, 3,862 tons millstuffs, 6,769 tons cured meats, 9,490 tons dressed beef, 2,353 tons hides and 4,301 tons lumber. The three Vanderbilt lines carried 40.0 per cent. of all the business, and the two Pennsylvania lines 25.9 per cent.

GEO. WESTINGHOUSE, JR.,
President.T. W. WELSH,
Supt.JOHN CALDWELL,
Treasurer.W. W. CARD,
Secretary.W. W. WESTINGHOUSE,
General Manager.

THE WESTINGHOUSE AIR BRAKE COMPANY

PITTSBURGH, PA., U. S. A.,

MANUFACTURERS OF THE

WESTINGHOUSE AUTOMATIC BRAKE

The WESTINGHOUSE AUTOMATIC BRAKE is now in use on 22,000 engines and 270,000 cars. This includes (with plain brakes) 180,000 freight cars, which is about 18 PER CENT. of the Entire Freight Car Equipment of this country, and about 80 per cent. of these are engaged in interstate traffic, affording an opportunity of controlling the speed of trains by their use on railways over which they may pass. Orders have been received for 120,000 of the Improved Quick-Action Brakes since December, 1887.

The best results are obtained in freight train braking from having all the cars in a train fitted with power brakes, but several years' experience has proven conclusively that brakes can be successfully and profitably used on freight trains where but a portion of the cars are so equipped. Below is a graphical illustration of the progress made in the application of the Automatic Brake to freight cars since its inception.

Year.	No. per year.		Grand total.
1881	105		105
1882	1,085		1,190
1883	4,966		6,156
1884	15,051		21,207
1885	10,410		31,617
1886	8,946		40,563
1887	9,281		49,844
1888	27,696		77,540
1889	26,065		103,605
1890	50,502		154,107

154,107 freight cars fitted with the Westinghouse Automatic Brake, which is more than 15 per cent. of the Entire Freight Car Equipment of this country.

E. L. ADREON, Manager.

JOHN B. GRAY, Agent.

C. C. HIGHAM, General Supt.

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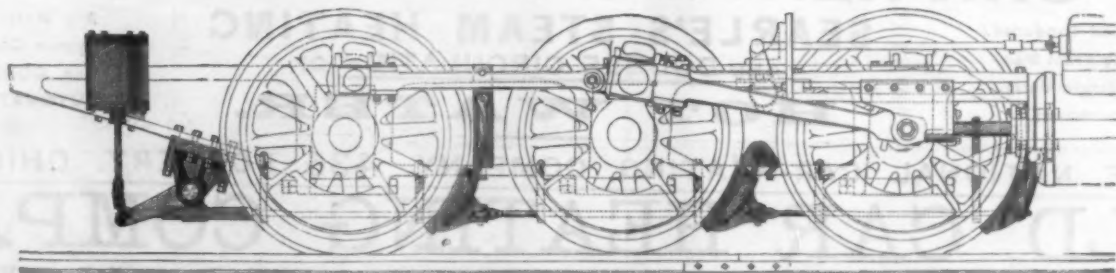
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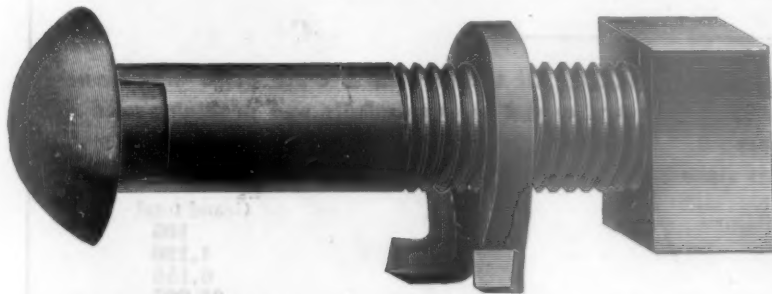
FOR OHIO AND EASTERN STATES: (CONGDON SHOES) RAMAPO WHEEL & FOUNDRY CO., Ramapo, New York.

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FOR SOUTHERN STATES: THE ROSS-MEEHAN BRAKE SHOE FOUNDRY CO., Chattanooga, Tenn.

Shoes should be ordered in accordance with the above allotment of territory.

THE "STANDARD" NUT LOCK



Manufactured under D. O. Ward's Patents by the

STANDARD NUT LOCK CO.,

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SAMPLES FREE.

This nut lock is presented on its merits as the best and cheapest device for securing track joints.

It is a torsional loop made of good quality of tempered spring steel, having horizontally inclined foot pieces, which are curved inward, thereby greatly increasing the spring resistance and acting simultaneously: rests upon the base of angle bar, or underlying rail base in case of fish plate, preventing the loop portion from rotating and hammering down thread of bolt.

The nut lock for $\frac{3}{4}$ bolt made of $\frac{1}{4}$ in. square steel, standard pattern, yields a tension of 4,300 lbs. on the bolt, which is sufficient to reduce the wear of the bearing surfaces of the angle bar on the rails, imparting, as it does, a uniform bearing the entire length of the bar.

The "Standard" Nut Lock has sufficient elasticity to maintain a tight joint, which cannot be truthfully said of many light-weight single coil washers.

The "Standard" Nut Lock is, in its superficial form, similar to an annular coil twisted out of plain, i. e., the curved shoulders or ends of the loop proper are spread in the usual manner of spring coils, at which bearing points the locking friction is equal to that of the best single coil washer, and added to this it is terminated in inwardly curved extensions, which must apparently furnish additional short leverage spring force of a torsional character.

Distinctive Merits of the "Standard" Nut Lock, Condensed:

Fixedness of position—cannot rotate and hammer down threads of bolt.

Cannot get one end into elongated slot of angle-bar.

Unlike any permanently placed, double washer, the Standard is interchangeable regardless of distance between bolts.

Cannot be put on wrong side out, as the outward projection of the foot pieces would prevent the nut being turned up.

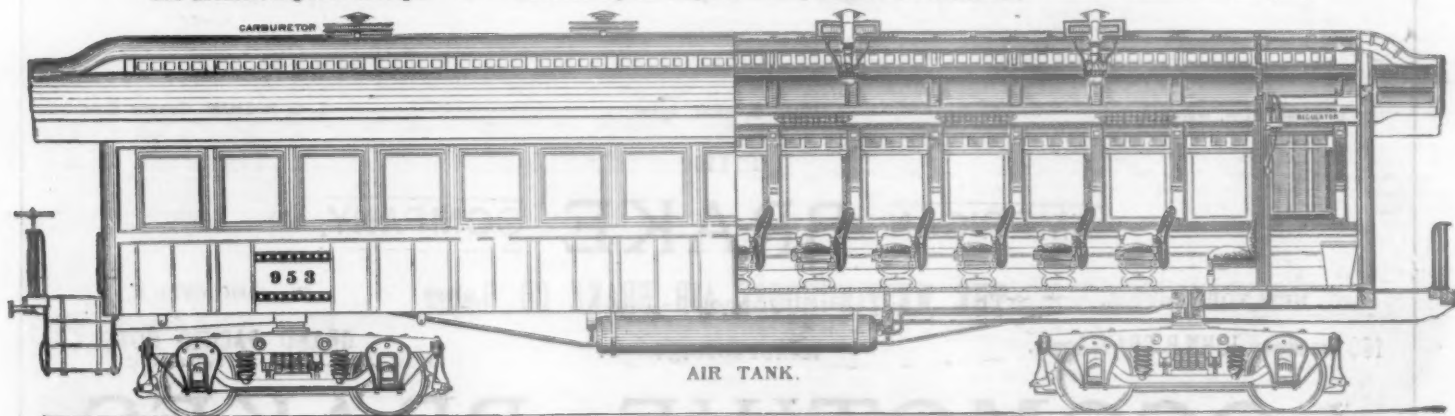
Has more spring power directly under the nut than any two ordinary coil nut locks. Being fixed in position, it offers double the locking friction of nut locks, which when in their dead "set" condition turn back with nut by the vibrative effect of passing train.

The "Standard" Nut Lock embodies the old principle of spring power improved by overcoming the objection to the double washer or nut lock, and covering the weak points of the single coil washer.

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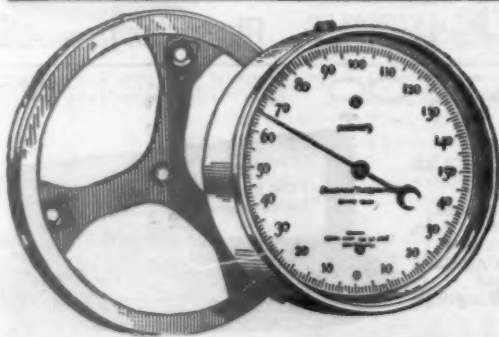
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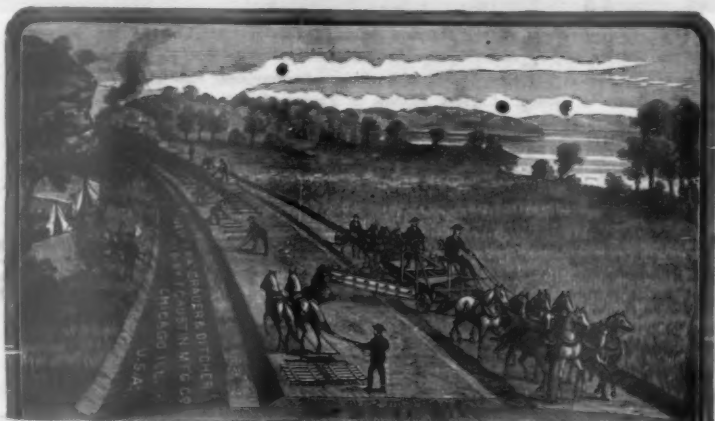
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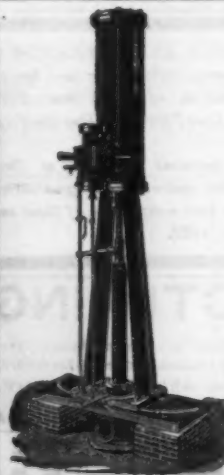
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The practical experience of eighteen years in Well Sinking in almost every State in the Union enables us to determine the best Practical and most Economical Method of Securing the most Satisfactory Result in procuring a Water Supply. We claim that the Tube Well Material manufactured by us is without an equal in the United States, and we have abundant testimonials in support of our claim. Estimates made on work in all parts of the United States. We refer the public to the Memphis Artesian Water Company, by whom our system is solely and entirely used.

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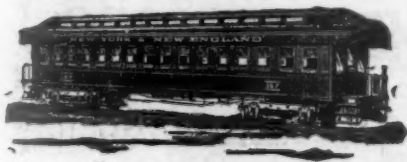
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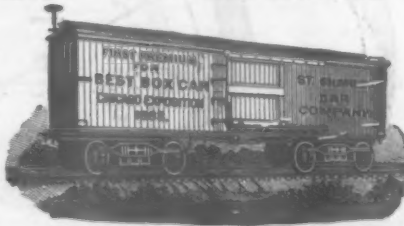


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ST. CHARLES, MO.

CHARLES F. PIERCE, Manager of the TIFFANY REFRIGERATOR CAR CO., has introduced during the past season decided improvements in the ice tanks used in these cars. Packers and Dressed Beef people using refrigerator cars know that the largest part of their expense in maintaining these cars in good order is the frequent repairs necessary. The form of ice tank referred to, of which over THREE HUNDRED are being built, is a decided improvement over any other now in use. Fifteen per cent. increased carrying capacity and One-Third to One-Half Less Ice; also a saving of from Fifteen to Twenty-five Dollars in the cost to each car, are among the advantages.

These strong claims and decided advantages will commend themselves to Dressed Beef Shippers, Packers, Railroads and Car Builders.

A number of these cars have seen service during the entire season, some carrying dressed beef to New York, Boston and Baltimore since January ast, with uniform and satisfactory results every trip. The A. T. & S. P. have ordered 200 of these cars, with the Bismarck Ice Tanks, and the K. C., S. & M. have ordered 100 cars.

See illustration in the "Railroad Gazette," Aug. 31, 1888.

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Established 1845. Manufacturers of all descriptions of Railway Cars, Car and Locomotive Wheels, Frogs, Switches and Railway Castings. Employ none but Experienced Workmen, and have on hand a Large and Complete Stock of Seasoned Lumber, sufficient for several years' consumption. Special facilities for furnishing Sectional Work for Exportation.

DAILY CAPACITY, ONE PASSENGER AND SIX FREIGHT CARS. SHIPMENTS MADE FROM NEW YORK OR BOSTON.

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This Curved Safety R. R. Spike Has the Only True Principles for a Spike and Will Always Do the Work.



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AGENTS WANTED TO INTRODUCE IT.

All Spike Manufacturers will be allowed to make them conditionally.

S. C. HILL, General Manager, Eighth and F Streets, Washington, D. C.

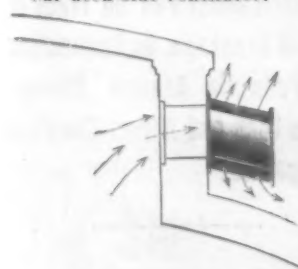


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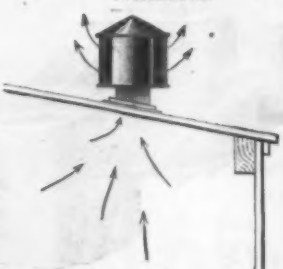
Strong exhausts from the impinge of the outside air, and ABSOLUTELY ANTI-INGRESS.

The drooping form, Passenger Car deck-side Ventilator.

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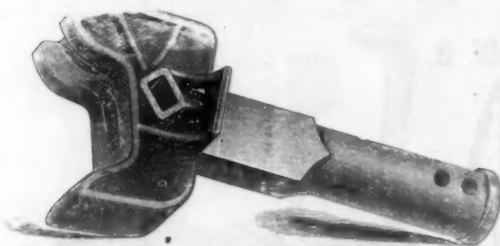
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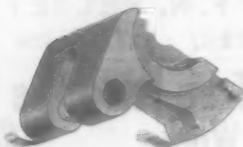
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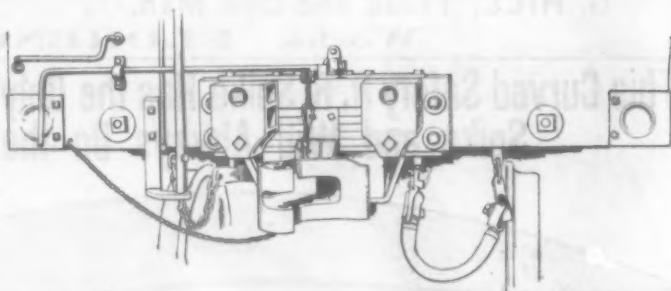
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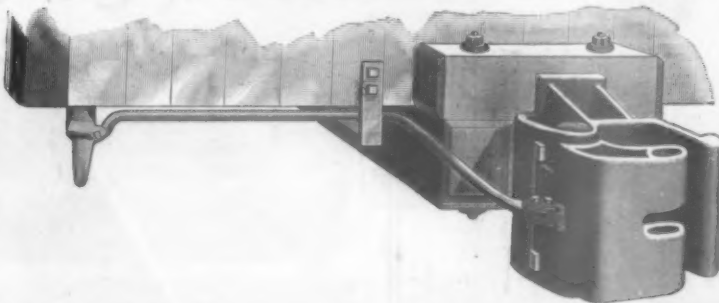
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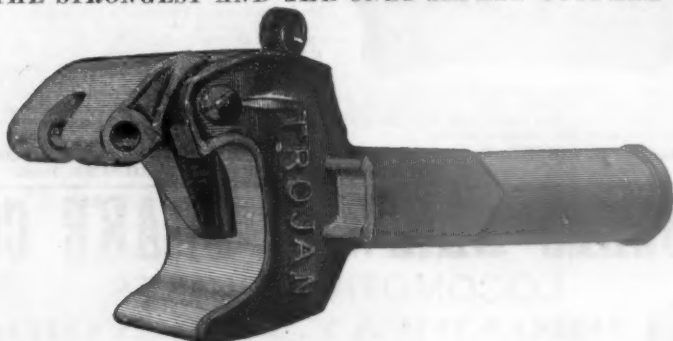
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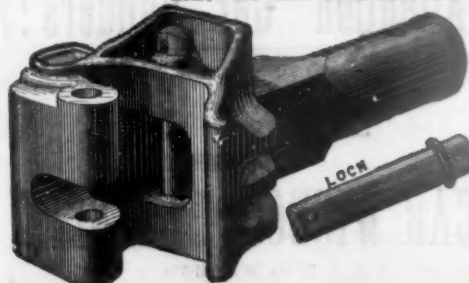


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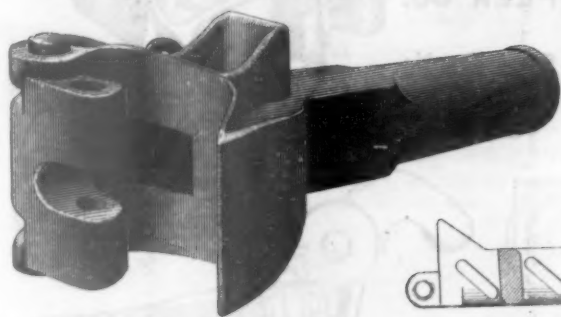
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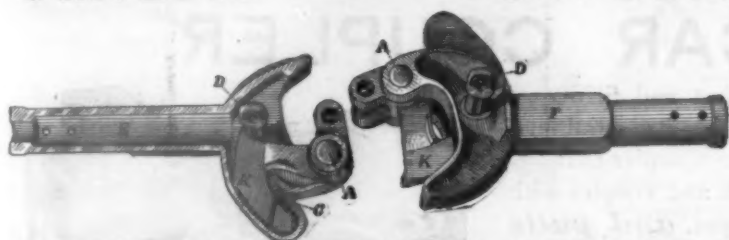
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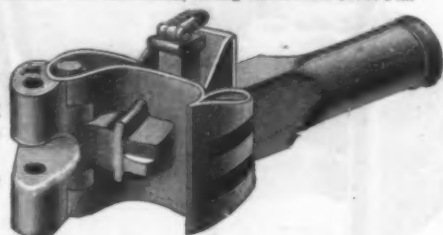
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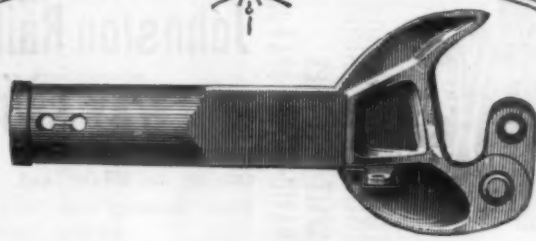
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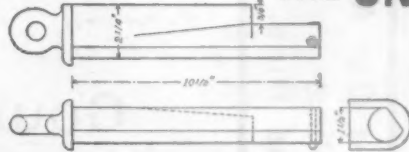
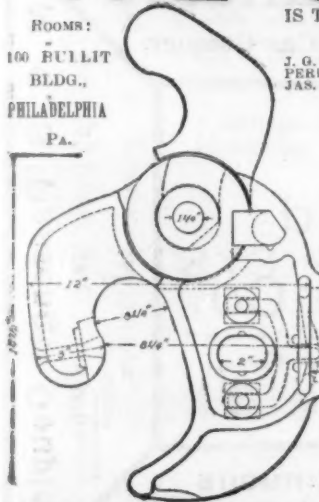
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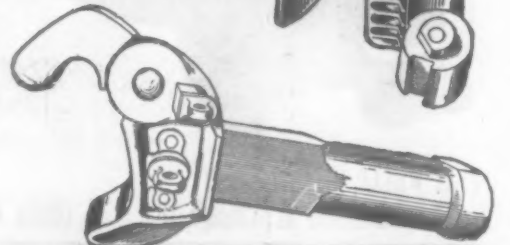
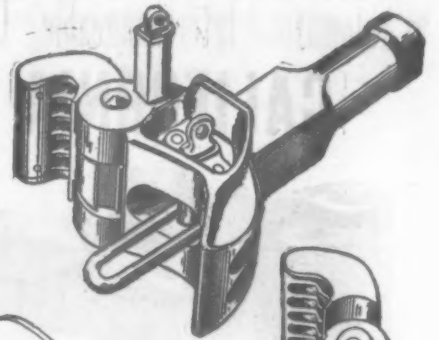
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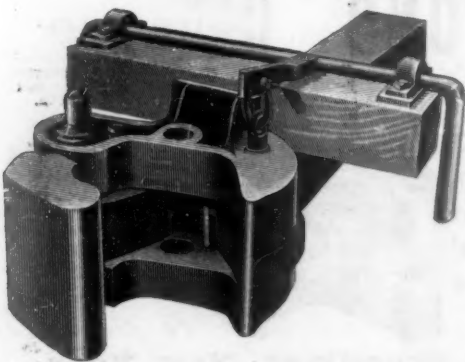
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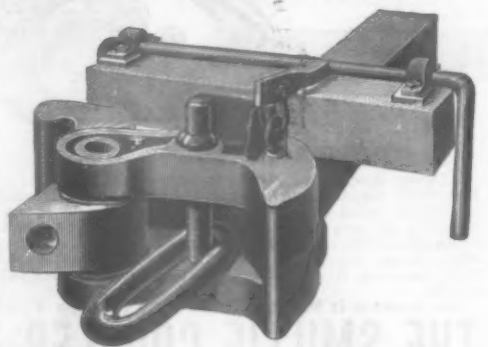
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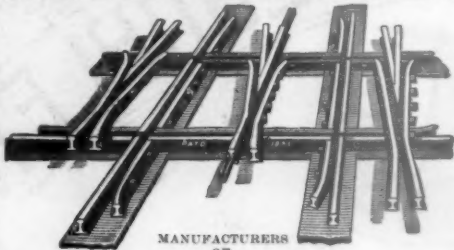
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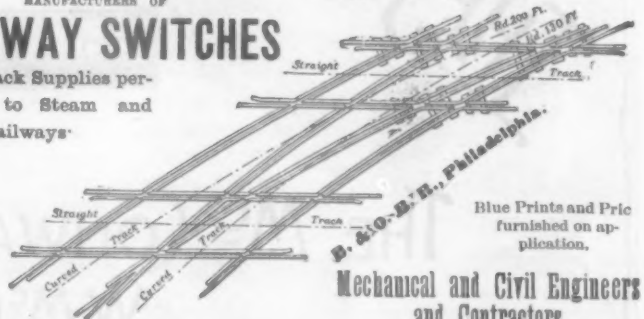
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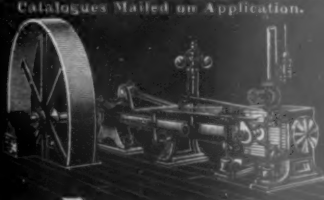
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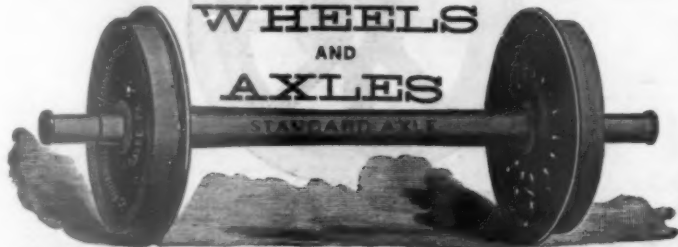
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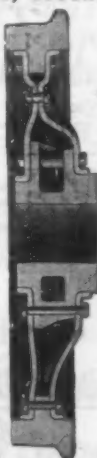
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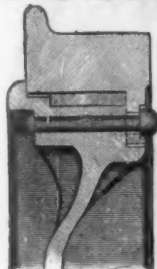
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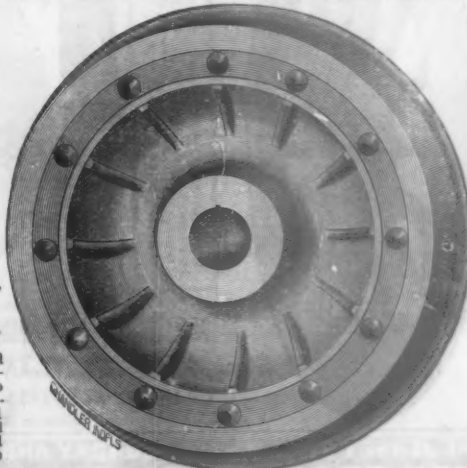
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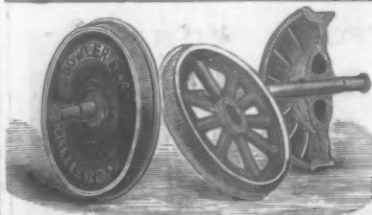
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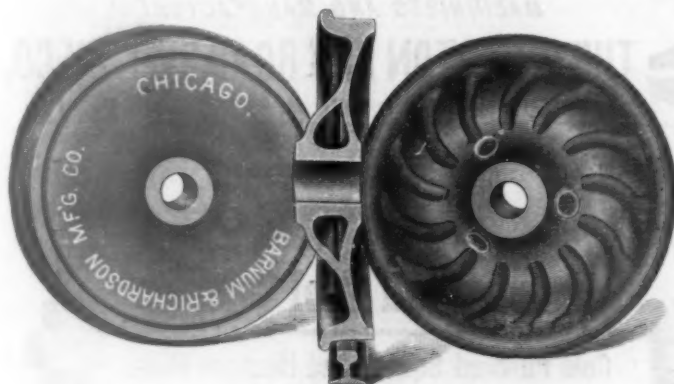
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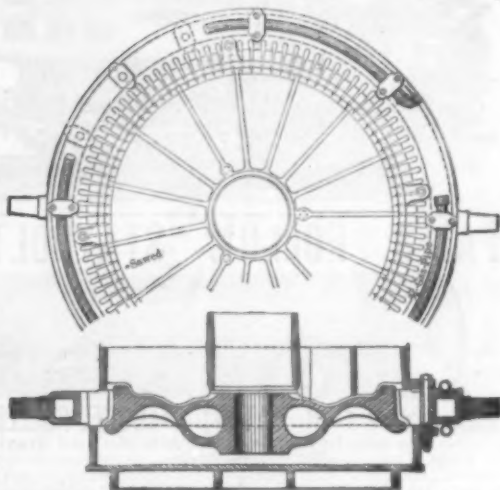
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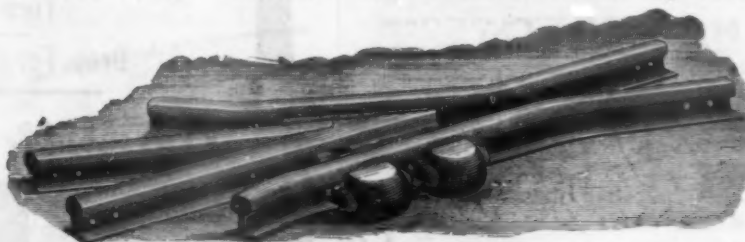
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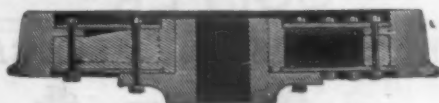
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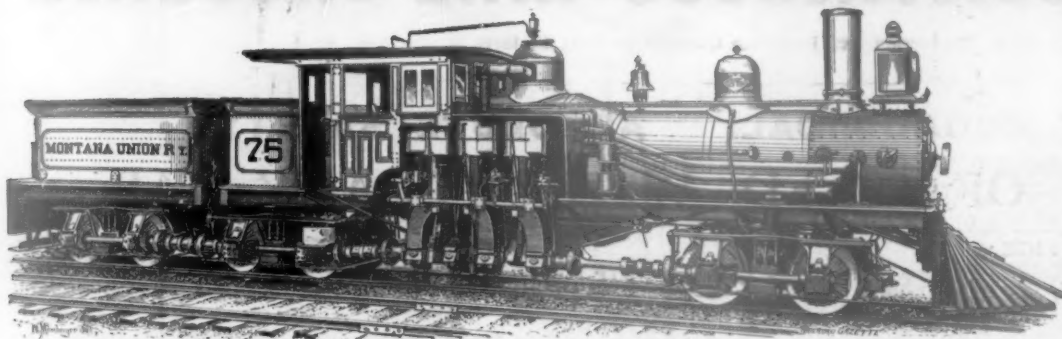
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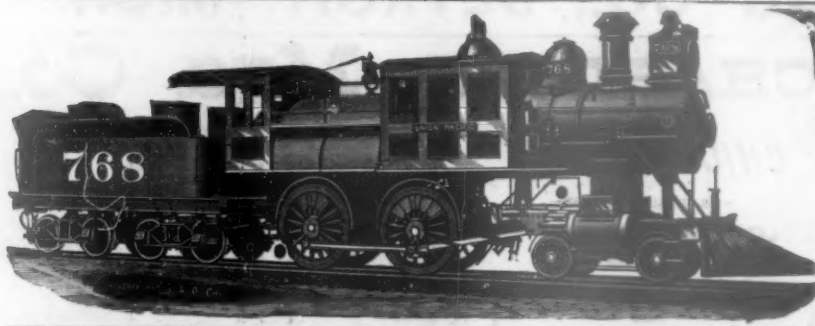
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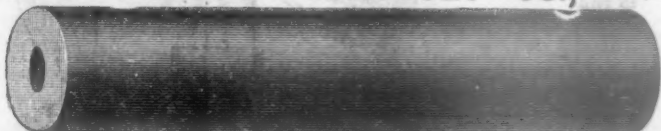
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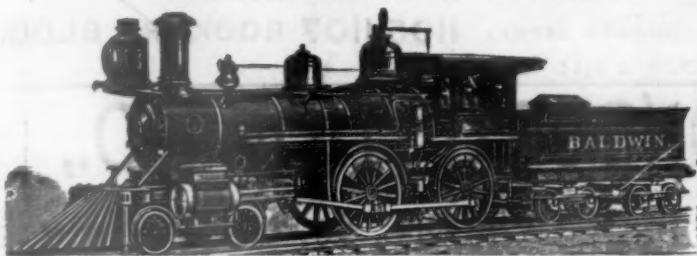
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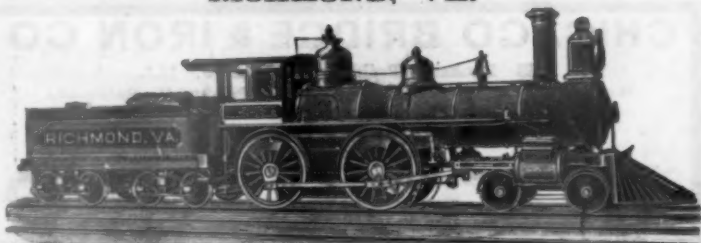
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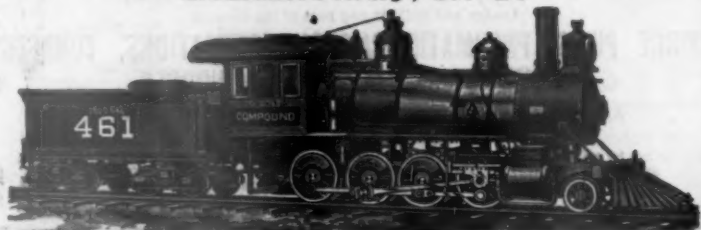
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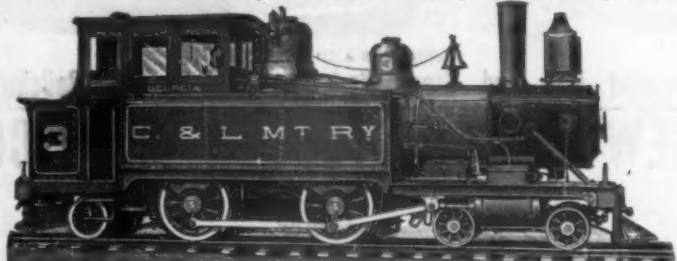
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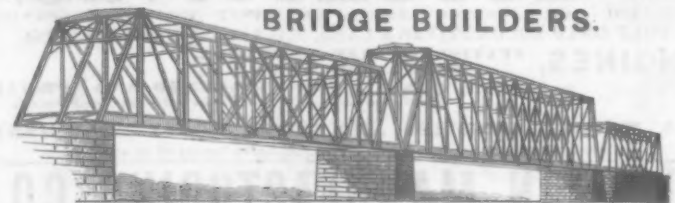
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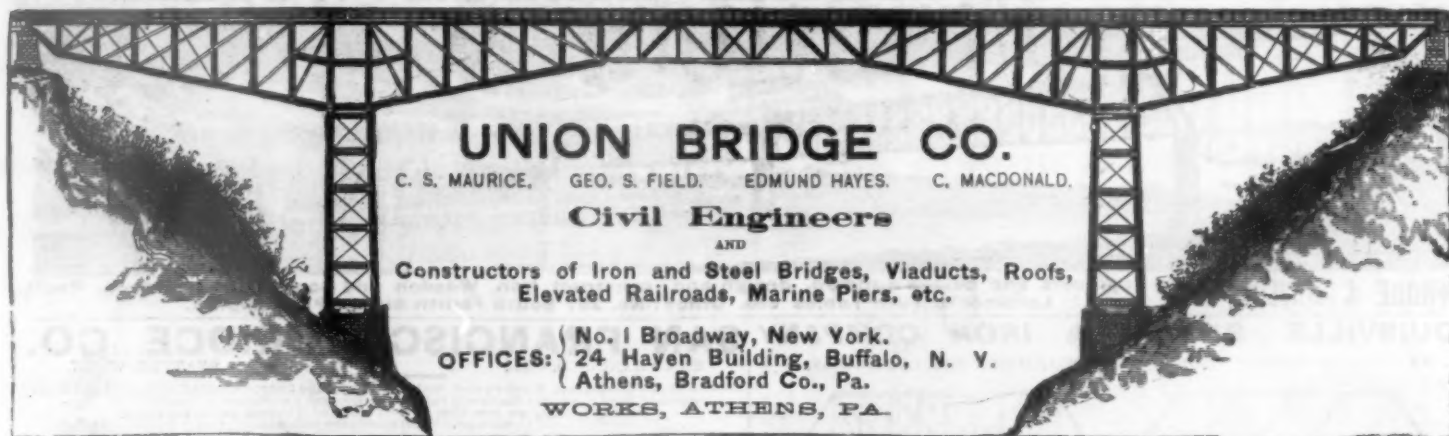
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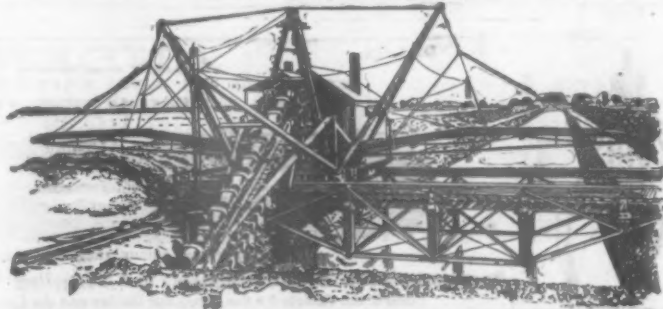
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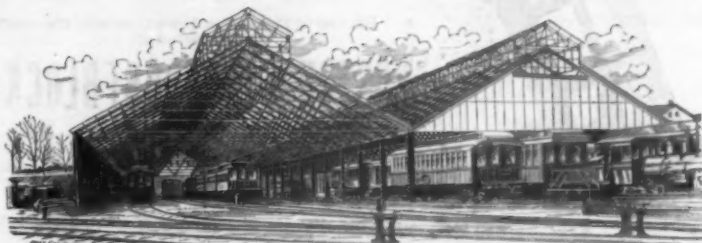
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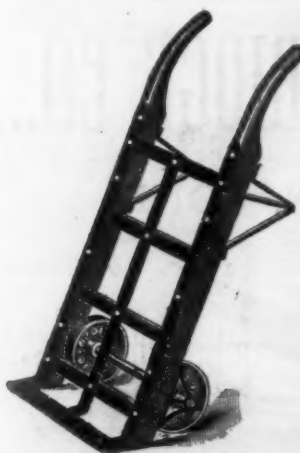
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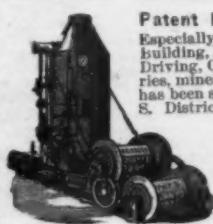
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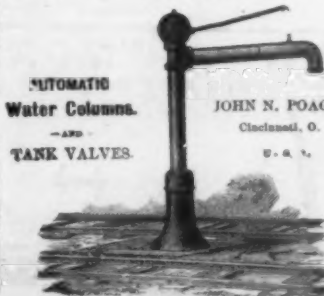
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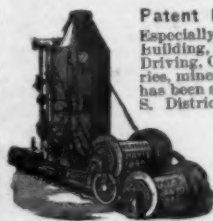
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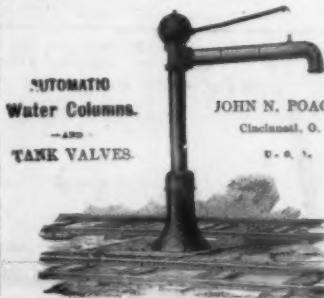
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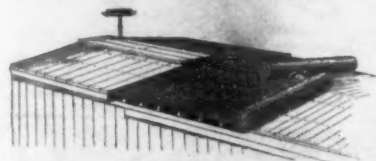
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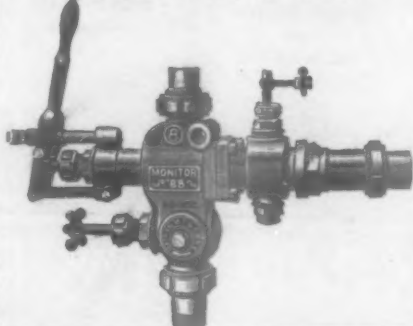
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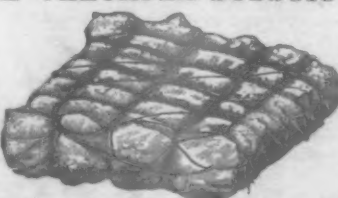
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